

CLUSTER/ONE MODEL ATM

Network File Server Version 1

Product Number A-2801

System Manager's Manual

NESTAR

NESTAR SYSTEMS, INCORPORATED

CLUSTER/ONE MODEL A (TM)

NETWORK FILE SERVER Version 1
Product Number A-2801

SYSTEM MANAGER'S MANUAL

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How to Use This Manual

This edition of the System Manager's Manual corresponds to Version 1, Release 1.1.1 of the Network File Server and Revision 1 of the Network File Server User's Manual. It is designed for experienced programmers who know the Apple DOS and Apple Pascal programming systems, and who are familiar with the 6502 processor and Apple I/O hardware. This manual assumes that the reader has a working knowledge of the Nestar Cluster/One Model A system and understands the accompanying Network File Server User's Manual. The objectives of this manual are two-fold: i.) to help the System Manager bring up the Network File Server for the first time, and ii.) to act as a reference manual for maintaining the Network File Server.

The basic organization of this manual is as follows. Chapter 1 gives an overview of the Cluster/One Model A Network File Server. Chapters 2 and 3 on Hardware and Software Installation are intended as a tutorial for booting the system. Chapter 3 also lists some software modifications that can be made onsite to tailor the system to specific needs of the users. Chapter 4 examines more fully the subject of setting up system and user files, and explains the operation of the system console. If this is your first Cluster/One we suggest that you read chapters 1 through 4 in succession and follow the directions therein.

For more experienced Network File Server users, chapters 4 and 5 are to be used as reference. Chapter 4 gives complete command descriptions for all the privileged system console commands. Chapter 6 explains how to run the Nestar Disk Utility programs provided with your system. Chapter 7 describes the Nestar Clock/Calendar option.

This edition of the System Managers Manual incorporates all modifications to the Cluster/One Model A system made in Nestar File Server Version 1.1.1. Of special interest to the former Version 1.0 user will be new Cluster/One support for

- (a) enhanced file server command capability and disk storage capacity
- (b) new Apple operating systems DOS 3.3 and Pascal 1.1
- (c) electronic office mail and Clock/Calendar options
- (d) new DOS and Pascal user utilities
- (e) new NFS utilities
- (f) multiple file server capability

THIS MANUAL

Appendix C provides a checklist of changes in this release.

We welcome criticisms and suggestions. Forms for reporting program bugs and documentation inadequacies are included near the back of this manual.

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Chapter 1

Introduction

The Cluster/One Model A system, developed by Nestar Systems, Inc. of Palo Alto, California, is based on a multiple access local computer network. The network transmits data among communicating stations, which may be hooked together in any desired topology. Each Apple station on the network has a Network Interface Card in one of its peripheral slots.

There are two basic types of stations on the network: user stations and server stations. User stations are stand alone computing facilities except that they may access shared resources via the network. Server stations provide a service to the user stations: sharing a peripheral device such as a disk or printer, delivering mail, gathering statistics, etc.

The Cluster/One system provides a sophisticated file server station called the 'Network File Server' or NFS. NFS is responsible for managing virtual diskettes for the user stations. NFS runs on a standard Apple Pascal system, and is written in Pascal and 6502 assembler language. The purpose of this manual is to detail the installation and maintenance of the Network File Server.

The System Manager's Manual and Nestar Technical Notes are distributed together in a binder. Additional Technical Notes, as received, should be filed in the binder.

Chapter 2

Hardware Installation

The procedure listed below should be used in configuring your Cluster/One system hardware. Follow each step carefully, and if you have difficulties please call Nestar Systems.

2.1 Identifying User Station and Network File Server Network Interface Cards

The user station Network Interface Cards are identified by the code 'A1.1' on the black sticker on the EPROM on each card. The EPROM chip is the only 24-pin chip on the card, but the sticker is easily recognized in any case. There is a similar card, which is used in the Network File Server, but it has a EPROM identified as 'B1.1'. In the first file server, this card must have the address \$FE (see Section 2.2). The card may also be recognized by the resistor pack which is installed in the socket just above the (C) 1980 legend in the lower left hand corner of the card. This resistor pack is NOT present on the user station cards.

2.2 Addressing Network Interface Cards

Each station must have a unique address programmed on the address shunts. When holding the card in your hand with the network cable connectors in the upper right hand corner, the shunts, in socket position S1, are read as follows:

bit	7	6	5	4	3	2	1	0
most significant								least significant

where bit 0 is closest to the letters "S1" on the board. A broken shunt signifies a binary digit zero and a closed shunt signifies a binary digit one. All user station cards are shipped with shunt seven broken and therefore are address \$7F (the '\$' signifies hexadecimal). Addresses from 1 to \$7F are available for use by user stations. All other addresses are reserved for standard Nestar subsystems.

Addresses are programmed by breaking the shunts where a zero is desired using a small sharp tool. For example, if shunts 2,4 and 5 are broken on a user station card its address would be 01001011 (binary) or \$4B (hex).

The first file server must be labeled \$FE; it is suggested that subsequent file servers be labeled \$FD, \$FC, etc. User stations must be set to unique numbers in the range 1 to \$7F (127). It is suggested that the numbering begin with 1, that

HARDWARE

labels be placed on the cards to indicate station number, and that a record be kept of user station locations and numbers. Having more than one station on the network with the same address will cause no physical damage, but will result in a variety of network and file server problems that may be difficult to diagnose.

2.3 Installing Network and Controller Cards

WARNING: TURN OFF APPLE COMPUTERS BEFORE INSERTING CARDS.

2.3.1 Configuring User Stations

All user stations should have a Network Interface Card plugged in. The card may be used in any slot in the Apple user station except slot zero. We highly recommend that the card be placed in slot 6 for the purpose of standardization and ease of use with Apple Pascal.

2.3.2 Configuring the Network File Server

The Network Interface Card in the Network File Server MUST be in slot 6, and will NOT function properly if used in a different slot. It must have the B1.1 ROM installed, must have address \$FE and must have a resistor pack in socket RN2.

The floppy disk controller card, if present, must be installed in slot 4. The cable from the controller card to the floppy disk cabinet is installed with the red stripe DOWN. If a hard disk is present, the hard disk controller card goes in slot 2. If a second hard disk is present, the second controller card goes in slot 3. The hard disk controller cards and cables come attached to the hard disk cabinets and should not be changed. If for some reason they become separated, the connector attaches to the card so that the side with the ribbon cable coming out of it faces down, with the red stripe toward the back of the Apple.

The Clock/Calendar card, if used, must be plugged in slot 1. Slots 5 and 7 are unused.

NFS Slot Assignments

Slot number	Card
0	Pascal language card (required)
1	Clock/calendar card
2	Hard disk unit 5 controller card
3	Hard disk unit 6 controller card
4	Floppy disks units 1,2 controller cards
5	(unused)
6	Network interface card (with Bl.1 rom)(required)
7	(unused)

The Apple II selected for use as the Network File Server must be ultra-reliable: its RAM chips must be perfect and the Language Card used with it must be operational. You should ensure the operational soundness of this Apple by exercising it extensively under Apple Pascal.

NOTE: You should NOT use an Apple II with a revision 0 motherboard on the Nestar system as either a user station or file server; it does not have a power-on reset, and may disrupt the Network.

At NO time should the Network File Server be run with a serial or communications card (or various 80-column cards which emulate these peripherals) in any slot, or with any cards other than those supplied by Nestar (with the exception of the required Language Card in slot 0).

2.4 Connecting the Network

Any network topology may be used in cabling the stations together. Typical configurations include a single line, an 'E' shape, a ring, etc. The total length of a single network must not exceed 1000 feet. If flat ribbon cable is used for the network then it is installed with the red stripe UP everywhere (note that this is the opposite of the way the floppy disk controller cable is installed). The file server may be anywhere on the network.

Note: Nestar Cluster/One Model A Technical Note #6 ("ClusterBus Cabling Information") contains additional information on configuring the NFS system.

Chapter 3 describes how to install the Nestar Cluster/One software. Chapter 4 describes File Server operation in detail.

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2.5 Checking the System

Before running the network, check for errors in the configuration of your system by bringing up the file server following the procedure outlined in this section.

If your system does not have hard disks, insert the Nestar distribution diskette labelled /MAIN in the left disk drive, and the diskette labelled /UTILS in the right drive. These diskettes need not be present if your system has a hard disk. However, if your system has a hard disk but you plan to use a dual floppy disk drive as well, insert diskettes in both drives so that all drives may be checked.

Whether using hard disks, floppy disks, or both, check to insure that the disk controller(s), clock/calendar card and network interface cards are installed as described in Section 2.3.

Disconnect the network cable from the file server interface card. It is best to bring up the file server with no user stations connected when first checking the system for installation errors. Once the file server is operating correctly, user station Apples will be added to the network one by one.

Turn on the floppy disk drives (switch in the back) and hard disk drives if present (switch by the power cord). Now turn on the Apple to run the Network File Server by flipping the power switch on the back of the case. The hard disk drives have a warm-up period of about 3 minutes, before which they will not respond to disk accesses. To avoid this wait we recommend that the hard disk be left on at all times, except when it is moved.

During the hard-disk warmup period the ROM boot program polls each unit (5,6,1, and 2) and attempts to boot units that are ready. On the screen, you will see error code "0D" for units which have no controller installed, and "80" for installed controllers with not-ready devices. (See Appendix A for a description of error codes.)

When a bootable system volume is located, a field of reversed @s will be displayed, followed by the Nestar logo.

The logo appears as:

```
*****
*** NESTAR CLUSTER/ONE MODEL A ***
***          VERSION 1.1          ***
*****
```

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PRESS <ESC> TO BYPASS
CHAINING TO NFS...

The file server will now come up and be active. Type in

SHOW VOLS <return>

This file-server command will display all currently active physical disk drive names and numbers. Verify that all drives in use are listed. Installations using both hard and floppy disk drives should have already inserted diskettes in Units 1 and 2 (the dual disk drive). If not, insert the diskettes, so that all drives are checked. To insert diskettes after the file-server is running, type

DISK CHANGE Uu <return>

where u is "1" for the left drive and "2" for the right drive. DISK CHANGE is described in Section 4.4.2. Use the SHOW VOLS command again to verify that the floppy drives are active.

Connect the network cable to the file server network card and the network card in slot 6 of the nearest user-station Apple. Remember to power off the Apple before inserting or removing any peripheral cards. Turn on that user station and verify that the Nestar logo appears on the user station screen. If the logo does not appear, make sure that the Apple is booting from slot 6. Connect all user station Apples in this way, one-by-one, confirming with each that the logo appears.

The most common installation errors are attaching a user-station network cable with the red stripe down and having user stations with the same station number. Adding stations one by one eliminates the confusion caused by bringing up multiple stations simultaneously and encountering such errors.

Chapter 3

Software Installation

3.1 Installation Requirements

Some knowledge of the Apple Pascal and DOS operating systems is helpful for installing the Nestar system; in particular, knowledge of the various system commands and use of the keyboard. Detailed knowledge of Pascal language programming techniques is not necessary. Please refer to the Apple DOS and Pascal Reference Manuals for any questions you might have on the operation of these systems.

The Apple II to be used as the Network File Server should be configured as described in Chapter 2. If one or two hard disks are present, all software necessary to bring up the system resides on one of them. Likewise, if the system is to use dual 8" floppy disks, all necessary installation software is included on the diskettes distributed with the system. The disks need only be inserted in the disk drives and, with the hardware configured as in Chapter 2, the system will bring itself up automatically at Power On (refer to Section 3.3 for details.) The only software installation required concerns setting up users' virtual disks and copying certain additional Pascal operating system components into a common library area for use by Pascal users. (DOS is already included in the distributed system.)

System Managers installing the optional Clock/Calendar should see Chapter 6 for instructions.

3.2 Contents of the Nestar Distributed Diskettes

The Network File Server software is shipped on the hard disk (if present) or on three double-sided 8" floppy diskettes labeled /MAIN, /DOS, and /PASCAL. In addition, both hard disk and floppy disk systems will receive a backup, write-protected set of floppy diskettes labeled /MAIN, /DOS, and /PASCAL.

SOFTWARE

The /MAIN distribution 8" floppy diskette (or the hard disk) is a bootable file server diskette containing the following file hierarchy:

```
/MAIN          [root directory]
/MAIN/BOOT     [user station boot program]
/MAIN/SYSTEM/BOOT [file server, boot program,
                  and utilities
                  Pascal volume name is BOOT:,
                  files are NFS,SYSTEM.PASCAL,
                  SYSTEM.APPLE,SYSTEM.LIBRARY,
                  SYSTEM.STARTUP,SYSTEM.MISCINFO,
                  FILTRAN,FORMAT,FILCHECK,FILDEBUG,
                  HDISK,DISKCOPY,CLOCKSET,
                  THIRD.BOOT]
/MAIN/SYSTEM/HELP [help files]
/MAIN/SYSTEM/ERRORS [error messages]
/MAIN/SYSTEM/PATHNAMES [paging area for names of mounted
                        files]
/MAIN/SYSTEM/TRACE [NFS command trace data file]
/MAIN/SYSTEM/PROFILE/$00 [default user station profile
                          (used by BOOT)]
```

The second 8" floppy (or hard disk if present) contains:

```
/DOS          [root directory. On the hard disk, the
               files shown here are in the /MAIN/DOS
               directory.]
/DOS/3.2.1    [DOS 3.2.1,HELLO,IHELLO,APPLESOFT,
               NESTAR DISK COPY,FILEINFO,SETPROFILE]
/DOS/3.3      [DOS 3.3, HELLO, IHELLO, APPLESOFT,
               NESTAR DISK COPY,FIDMORE, FILEINFO,
               SETPROFILE,and VDOS CREATE]
/DOS/LIB      [Pascal volume with name LIB:. Files
               are INTBAS.DATA and FPBAS.DATA]
```

The third 8" floppy (or hard disk if present) contains:

```
/Pascal       [root directory. On the hard disk, the
               files shown here are in the /MAIN/PASCAL
               directory.]
/PASCAL/LIB   [user station utilities
               Pascal volume name is PASCAL:,
               files are TDELETE,DIRLIST,FILEINFO,
               DATEUNIT,CMD,CMDHELP,FIXDIR,NETLINK,
               ZAPPASCAL,TRACE,BSAVE,SETPROFILE,
               NETWORK.LIBRARY,NESTAR.START,
               FPBAS.DATA,INTBAS.DATA,SYSTEM.PASCAL,
               SYSTEM.APPLE,SYSTEM.MISCINFO]
```

SOME OF THESE FILES ARE PROTECTED BY PASSWORDS AND HAVE RESTRICTED ACCESS RIGHTS. You can determine the protection status of a file by using the 'SHOW PROTECTION filename' command when NFS is running. IN ALL CASES, IF A PASSWORD IS USED ON A FILE ON THE DISK AS DISTRIBUTED BY NESTAR, THAT PASSWORD IS "NESTAR". You may want to change these passwords for your installation (using the PROTECT command).

/MAIN/BOOT is a binary file which contains the network user station BOOT program that is described in Appendix B of the User's Manual, and in Section 3.6 of this manual.

/MAIN/SYSTEM/BOOT is the virtual Pascal volume that the Network File Server boots from, and contains:

NFS.CODE - the Network File Server program.

SYSTEM.PASCAL, SYSTEM.APPLE,
SYSTEM.LIBRARY, SYSTEM.MISCINFO

- Programs necessary to run in the Pascal environment (distributed under license from Apple).

SYSTEM.STARTUP

- the program that is run when the Network File Server is powered on.

FORMAT.CODE, DISKCOPY.CODE,
FILTRAN.CODE, FILDEBUG.CODE,
HDISK.CODE, FILCHECK.CODE

- offline Network File Server Utilities used to maintain the file system.

CLOCKSET - the utility used to set time and date in the optional Clock/Calendar.

THIRD.BOOT

- the final (third) level bootstrap used for bringing up Pascal for the Network File Server station.

The rest of /MAIN/SYSTEM contains:

ERRORS - the text for all the error messages.

HELP - a directory of files containing the text

for the HELP command.

PATHNAMES - a paging area for names of mounted files.
TRACE - storage area for NFS command trace data.
PROFILE/\$00 - the default user station profile for BOOT.

/PASCAL/LIB is the virtual volume containing the user station utilities available in the Pascal environment. NETWORK.LIBRARY contains utility subroutines, such as NETUNIT, that can be called from within a Pascal program. Pascal utility programs are described in Chapters 7 and 8 of the Users Manual.

/DOS/3.2.1 and /DOS/3.3 are bootable Apple DOS Master virtual volumes containing NESTAR DISK COPY, FILEINFO, and SETPROFILE, utility programs for Apple DOS users. DOS/3.3 also contains VDOS CREATE, a program used to create DOS virtual diskettes of variable size in the DOS 3.3 environment. DOS utility programs are described in Chapters 6 and 8 of the Users Manual.

/DOS/LIB contains the integer and floating point BASIC systems, which may be downloaded to language-card RAM (if present) by the NESTAR BOOT program.

3.3 Booting the System for the First Time

Initial startup is described in Section 2.5. To recapitulate:

Configure the system as described in Chapter 2, with the distribution diskettes inserted in the dual disk drive if no hard disk is present. Turn on the floppy disk drives (switch in the back) and hard disk drives if present (switch by the power cord). Now turn on the Apple to run the Network File Server by flipping the power switch on the back of the case.

During the hard-disk warmup period the ROM boot program polls each unit (5,6,1, and 2) and attempts to boot units that are ready. On the screen you will see error code "0D" for units which have no controller installed, and "80" for installed controllers with not-ready devices. (See Appendix A for a description of error codes.)

When a bootable system volume is located, a field of reversed @s will be displayed, followed by the Nestar logo.

The logo appears as:

```
*****
*** NESTAR CLUSTER/ONE MODEL A ***
***          VERSION 1.1          ***
*****
```

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PRESS <ESC> TO BYPASS
CHAINING TO NFS...

The file server will now come up and be active.

3.4 Setting Up User Directories and Disks

There are two environments in which user disks must be established: Apple DOS and Apple Pascal. We suggest a directory structure similar to the one pictured below. Following the diagram is a general explanation of how to set up your system.

```
/main  /boot
      /system /boot
          /errors
          /trace
          /pathnames
          /profile/$00
          /help  /create
              /mount
              ...
/dos   /3.2.1
      /3.3
/pascal /lib
/users  /fred  /1
          /2
          /ethel /stuff
          /doc
          /lucy  /boot
```

For installations using only floppy disks, /MAIN/DOS and /MAIN/USERS will probably be on a separate 8" floppy from /MAIN/SYSTEM and therefore will be accessed as /UTILS/... instead of /MAIN/... (or another name, but not MAIN.) On a hard disk installation they are all likely to be on /MAIN. They are referred to in the following as simply DOS/3.3, DOS/3.2.1.

3.4.1 Setting Up Disks For DOS Users

The DOS Master Boot volumes DOS/3.3 and DOS/3.2.1 have public read-only access as distributed by Nestar. This is to prevent inadvertent destruction of the volumes by inexperienced users. To boot these volumes requires that the password be specified in the message VOLUME TO BOOT: /MAIN/DOS/3.3:NESTAR. To change the password on the volume, use the command PROTECT /MAIN/DOS/3.3:NESTAR,PRVPW=XXX. To allow read/write access without specifying a password, use the command PROTECT /MAIN/DOS/3.3:NESTAR,PUBACC=RW.

To give users bootable volumes, boot DOS/3.3 or 3.2.1 from a user station. Issue the PR#6 command to allow NFS commands to be issued. Create the user volume, specifying type=DOS. For example,

```
@CREATE /MAIN/USERS/JOE/DOS,T=D,SECTORS=16,D2,RW.
```

Then, BRUN NESTAR DISK COPY to copy DOS/3.3 to /MAIN/USERS/JOE/DOS. Copy from slot 6 (boot slot) drive 1 (boot drive) to slot 6 drive 2 (where JOE/DOS is mounted). You can copy the volume number 254 from the master to the copy. (For DOS 3.2.1 volumes, specify SECTORS=13 in the CREATE command, and copy DOS/3.2.1 to /MAIN/USERS/JOE/DOS.)

The default profile specifies that DOS volumes should be mounted RW,UPD by the boot program; thus only one user may boot from any DOS volume at a time. If multiple users are to boot from a DOS volume, the station profile or default profile must be changed to specify RO,SHR access for DOS. This may be useful for a student environment where many small, non-bootable user volumes are used with one large, bootable volume. For more information on changing profiles, see section 5.8 in this manual.

Note that DOS users will have their Language or RAM card loaded from FPBAS or INTBAS in file /MAIN/PASCAL/LIB at startup. Therefore this file is useful even for DOS-only installations.

3.4.2 Setting Up Disks For Pascal Users

The complete Apple Pascal system is not shipped with the Model A system. The System Manager must install Pascal on the Nestar system and create virtual volumes for Pascal users. Before any Pascal users run the system, it will be necessary to follow the procedure listed below to copy the Apple-distributed portions of the Pascal system from a disk drive.

If the installation has no DOS users, the DOS/... disks are

not needed and may be removed.

If the installation has a floppy disk unit only, see Section 3.5 to decide if there are files on the distribution floppy diskettes which are not necessary in your environment. These files may be removed to make more space available for users.

3.4.2.1 Transferring Apple Pascal to the File Server

/MAIN/PASCAL/LIB is the virtual volume that the BOOT program (Appendix B of the User's Manual) MOUNTs on drive #5 as a library for Pascal users. (This may be changed using the SETPROFILE utility program, Section 5.8.) As shipped /MAIN/PASCAL/LIB does not contain SYSTEM.COMPILER, SYSTEM.FILER, SYSTEM.EDITOR, etc., which are needed to fully use the Pascal environment.

To copy the Pascal system files to /MAIN/PASCAL/LIB, follow the procedure listed here. Those familiar with the Pascal and Nestar systems may skim the directions for the underlined phrases.

NOTE: PASCAL/LIB is protected from write operations with the password NESTAR. The password or protection may be changed using the PROTECT command from the system console or from the CMD program at a user station. The current password must be given in the PROTECT command, as in 'PROTECT /MAIN/PASCAL/LIB:NESTAR,...'

1. Start the Network File Server according to the directions given in Section 2.5.
2. Configure a user station with a Network interface card in slot 6, a 16-sector Apple floppy drive in slot 5, drive 1, and a Pascal Language Card in slot 0. Ensure that all minidisks are for use with Apple Pascal Release 1.1.
3. Boot PASCAL/LIB at a user station by turning on the power and answering the prompt:

VOLUME TO BOOT:

with '/MAIN/PASCAL/LIB:NESTAR'

4. From the Pascal Command line, X(ecute) CMD. In response to the CMD prompt "Request?", type

UNMOUNT D5

Exit the CMD program by typing "Q".

SOFTWARE

5. Insert Apple1: the Pascal Release 1.1 system floppy diskette provided by Apple into local mini-floppy disk.
6. Enter the Pascal Filer (on Apple1:) by typing 'F'.
7. Transfer the Apple Pascal files from APPLE1: and APPLE2:
to PASCAL/LIB

from APPLE1:

SYSTEM.EDITOR
SYSTEM.FILER
SYSTEM.LIBRARY
SYSTEM.CHARSET
SYSTEM.SYNTAX

and from APPLE2:

SYSTEM.COMPILER
SYSTEM.LINKER
SYSTEM.ASSMBLER
6500.OPCODES
6500.ERRORS

APPLE1: and APPLE2: are diskettes distributed by Apple with the Pascal system. Be sure to use Release 1.1 of Apple Pascal. If you have an older release of Apple Pascal, see your Apple dealer for an updated release.

File transfer is done as follows:

1. The file to be transferred is on a 5 1/4" floppy diskette. Insert it in drive 1 of the controller in slot 5.
2. Type 'T' for transfer.
3. The filer will respond with:

TRANSFER WHAT FILE ?

Type in the volume name followed by the file name (e.g. APPLE1:SYSTEM.EDITOR). Then type <return>.

4. The filer will ask:

TO WHERE ?

Type 'PASCAL:\$'.

Do this for each file to be transferred.

The Pascal system normally requires each user to have SYSTEM.MISCINFO, SYSTEM. LIBRARY (if used), and SYSTEM.STARTUP (if desired) on the booted disk (#4:) when using the Nestar BOOT program. SYSTEM.PASCAL and SYSTEM.APPLE may be on the shared library volume (#5: or PASCAL:) if it is present (as is the default with Nestar BOOT). It is possible to modify SYSTEM.PASCAL so that any of these files (SYSTEM.MISCINFO, SYSTEM.LIBRARY, and SYSTEM.STARTUP) are located on the shared library volume (#5:) instead of on each user's private volume. To do this run the ZAPPASCAAL utility program discussed in Section 5.7.

5. PASCAL/LIB as distributed has room for no other files than those identified. To copy other files into it, you must remove files from it, using the Pascal Filer command "remove". Be careful not to remove files needed by your users.

3.4.2.2 Creating Bootable Pascal Volumes for Users

Using the steps listed below you may create Pascal volumes for users.

(Note that if the installation has a floppy disk unit only, there is very little free space for user data. See Section 3.5 to decide if there are files on the floppy diskettes that are unnecessary in your environment.)

1. Boot PASCAL/LIB at a user station by turning on the power and answering the prompt:

VOLUME TO BOOT:

with '/MAIN/PASCAL/LIB:NESTAR'.

2. From the command level of Pascal execute CMD by typing 'X'. The system will respond by saying:

EXECUTE WHAT FILE?

Type 'CMD' and press <return>.

3. CMD will display its copyright notice followed by its prompt ": ". Create the user's bootable Pascal volume (for instance, /MAIN/USERS/NAME/1) and mount it on drive 9 by typing:

CREATE /MAIN/USERS/NAME/1,T=P,D9,RW

SOFTWARE

(Make sure that there is NO minidisk controller in slot 4 of your Apple.)

5. Type Q<return> to exit CMD.
6. Go into the Pascal Filer by typing 'F'.
7. Zero /MAIN/USERS/NAME/1's directory by typing 'Z'. The filer will respond with:

ZERO DIR OF WHAT VOL ?

Respond with '#9:'. The filer will ask:

DUPLICATE DIR ?

Since Apple Pascal does not support this feature type 'N'. Next, it will ask:

OF BLOCKS ON THE DISK ?

Enter whatever number you used for SIZE=x when you created PASCAL/LIB. (280 blocks in this example, since SIZE= was not specified in the CREATE command.) Then it will ask:

NEW VOL NAME ?

We suggest you name the volume 'NAME:'. So type 'NAME' and <return>. It will ask if this is correct by:

NAME: CORRECT ?

Type 'Y'. The zero command terminates with the message

NAME: ZEROED.

Unless ZAPPASCAL has been run, you should use the Filer to transfer SYSTEM.MISCINFO to the new boot volume. Type

T

The system will respond

TRANSFER?

Type

#4 :SYSTEM.MISCINFO,#9 :\$

The system will respond

PASCAL:SYSTEM.MISCINFO --> NAME:SYSTEM.MISCINFO

The user can now boot a user station in Pascal by responding to the BOOT program with:

/MAIN/USERS/NAME/1

Note that the instructions for what pathnames to use (/MAIN/USERS/NAME/1) and what Pascal volume names to use (NAME) are only suggestions, and other naming conventions may be preferred in some environments.

3.5 Minimum On-Line Disk Files

For floppy disk only systems, on-line disk space may be at a premium. In certain circumstances, the system may be configured with some system files not present. Hard disk installations should always keep all system files on-line.

In order to boot the Network File Server, you should use a copy of the /MAIN disk shipped with the system. Once the NFS is running, it is possible (but NOT recommended) to remove this disk (assuming it is a floppy disk) during regular operations, but, as explained below, certain system features will not be available. You may insert any new disks after booting; be sure, however, to use the DISK CHANGE command (Section 4.4.2) when doing so.

There are several distributed files (or file hierarchies) which are very valuable to have on-line at all times, but none are absolutely required. These files are explained in the following sections. Be sure that you fully understand their use before removing any of them.

3.5.1 /MAIN/BOOT

/MAIN/BOOT should usually be on-line, since it allows user stations to boot. In principle one need not have this file on-line once all users have booted, but we suggest that it remain on-line even after all boots are completed, in case any stations need to reboot.

3.5.2 /MAIN/SYSTEM

Similarly, it is useful to have the entire /MAIN/SYSTEM subhierarchy on-line. There are six entries in it: BOOT, PROFILE, ERRORS, HELP, PATHNAMES, and TRACE. These contain: the file server and utilities code, the default values for individual station BOOT profiles; the full text of error messages; a collection of files that are used to supply the information provided by the HELP command; a paging area for names of mounted files; and data files for

the file server trace command.

These system files are required in the following cases: BOOT is needed to run the file server or the off-line utilities, or to exit from any of these programs. At least one entry in PROFILE (\$00, the default profile) must be present whenever /MAIN/BOOT is used. HELP contains informational data only and need not be present. ERRORS contains text for error messages; if it is not present file server messages will not be descriptive and will require reference to the Users Manual. PATHNAMES is used to save file server main memory space by holding the names of open files on disk. If PATHNAMES is not present when NFS starts, pathname information will be kept in memory, saving disk space but allowing fewer simultaneous mounts and locks. If PATHNAMES is present when NFS boots, but is later removed, then the NFS will not record the pathnames of mounted files and of default directories. SHOW MOUNTS and SHOW DIR commands will give 'NAME NOT FOUND' for file names. TRACE need not be present except when trace mode is turned on using the TRACE console command.

The FILTRAN utility may be used to copy some subset of the above files to a new system volume with more free space for user files. See Section 5.3 for details on the operation of FILTRAN.

NOTE: The system will search for these file on all units, looking for the volume-name MAIN. The name of the disk to which you copy these files must have the volume-name, MAIN.

PASCAL/LIB, DOS/3.3, and DOS/3.2.1 are used by specific user station environments. They may be deleted if not used at your installation.

3.6 Tailoring BOOT to the Individual Station

The BOOT program is a standard part of the Cluster/One Model A Network File Server, and provides a means for users to start up Apple DOS 3.2.1, DOS 3.3, or Apple Pascal Versions 1.0 or 1.1. over the network. (The binary virtual disk /MAIN/BOOT should not be confused with the Pascal virtual disk /MAIN/SYSTEM/BOOT which the Network File Server boots from.) BOOT is a machine language program which executes in Apple user stations, and resides in memory locations \$800 to \$1FFF. For a complete description of its function and operation please see Appendix B of the User's Manual.

Using the utility program SETPROFILE (described in Chapter 8 of the Users Manual; available on /MAIN/PASCAL/LIB, /MAIN/DOS/3.3, and MAIN/DOS/3.2.1), the system manager or network users can specify their station boot volume, as well

as whether the volume is to be booted automatically, what the Pascal or DOS access to the boot volume is to be, and, for Pascal, the name of the default library volume automatically mounted on drive 5.

If the user has not set a profile, BOOT uses the defaults specified in PROFILE/\$00. The system manager may keep the defaults distributed with the system, or change them using SETPROFILE. PROFILE/\$00 is read-only protected with the password 'NESTAR'. The password must be given if \$00 is being modified (see Section 5.8, SETPROFILE).

Requests for changes in the BOOT program other than those allowed by SETPROFILE should be forwarded to Nestar Systems' Custom Programming Department.

SETPROFILE allows the System Manager or user to do any of the following:

1. Change the default prefix, for the response to 'Volume to Boot: ', from /MAIN/ to some other string of characters. We suggest you use the prefix most commonly typed in by your users. For example, if you use a directory structure similar to that shown in Section 3.3, the best prefix would probably be '/MAIN/USERS/'. If your installation has floppy disks only, you may want the prefix to be '/Utils/'.
2. Cause the BOOT program to boot a volume automatically by entering the full pathname of a virtual volume in place of the prefix described in step 1. Note: After booting, a DOS Hello Program or Pascal SYSTEM.STARTUP program can read the number of the station by using the procedure given in Appendix D of the User's Manual.
3. Change the default mount access when booting DOS virtual disks from RW,UPD to some other combination.
4. Change the default mount access when booting Pascal virtual disks from RW,UPD to some other combination.
5. Change the name of the default Pascal volume (/MAIN/PASCAL/LIB) that contains Integer BASIC (INTBAS.DATA) and Applesoft BASIC (FPBAS.DATA), and that is automatically mounted on drive 5 for Pascal users.

3.7 Using DOS With More than Two Virtual Diskettes

When booting DOS 3.2.1 and 3.3 volumes, BOOT automatically sets 'maxdrives' to 255. The user may then mount virtual disks on any drive from 1 to 255.

Warning: If drive numbers greater than two are used when addressing real Apple II disk controllers, unpredictable results will occur.

3.8 Special Locations in the Network Interface Card

Assembly language programs running on a station may select the Nestar Network Interface Card by executing:

JSR \$Cn19

This routine has the effect of deselecting any other card using the \$C800 address space, selecting the Nestar card, and putting \$Cn in \$07F8 (the active slot location.)

Once the Network interface card is initialized and selected, the station number may be read from location \$C800. The Network Interface card is normally initialized by the BOOT program. If the station was booted from a local disk, or not booted, the Network Interface card may be initialized by executing JSR \$C900 after selecting the card, as above.

Chapter 4

Network File Server

4.1 File Server Startup

System startup is extremely simple and is discussed in Sections 2.5 and 3.3. To review:

With the disk controller(s) and network interface cards installed as described in Chapter 2 (Hardware Installation), turn on the Nestar Floppy Disk (button in the back), and the Nestar Hard Disk(s) if present (switch by the power cord.) The hard disks have a warm-up period of about 3 minutes, before which they will not respond to disk accesses. To avoid this wait we recommend that you leave the hard disks on at all times, except when moving them.

If no hard disks are present, place the appropriate system disk (for example, /MAIN (Boot Version 1.1)) in either drive 1 or 2. Then turn on the Apple to run the Network File Server by flipping the power switch on the back of the case. Nestar-provided software and firmware as described in Chapters 2 and 3 will boot the Apple under Pascal with the virtual volume (/MAIN/SYSTEM/BOOT) mounted on Pascal unit #4, will initialize the Apple, and will automatically chain to the file server code.

The ROM will put "UNIT 05" on the screen, and wait 2 seconds before attempting to boot that unit. To boot from a different unit, hit ESC on the Apple keyboard during this time. Unit 5 will not be booted and the ROM will go in order to units 6, 1, 2, and then start with 5 again. Hit ESC until the desired unit is reached. An example of use: a user has a problem with harddisk 5 and wants to boot from floppy unit 1, but keeps unit 5 connected for diagnostic purposes.

Most problems in booting from any particular unit will cause the ROM to try the next unit in the sequence.

After the unit number is selected, a field of @'s will appear on the screen, followed by the Nestar logo and the message

```
PRESS <ESC> TO BYPASS  
CHAINING TO NFS...
```

If the escape key is pressed, the system will come up in Pascal without executing the file server program, and you may then execute disk utility programs. If the escape key is not pressed within three seconds, NFS will execute.

If no clock/calendar card is present in the system or if the date is not set to a reasonable value, the following prompt will then appear

ENTER DATE (YYMMDD):

Enter the current date followed by <return>. The date is given as a sequence of six digits yymmdd for the year, month, and day. (For instance, July 3, 1981 would be entered '810703'.) No separating characters such as / or - are used. Never enter a date prior to the current actual date. Doing so will cause the internal file system information regarding the date an NFS File was last modified to be incorrect. If your Nestar system includes the clock/calendar option (Chapter 7), you must run the CLOCKSET utility to set the date (and time). This is required only at the time of initial installation, since the clock/calendar has a battery which maintains the time and date even when the Apple is turned off. If the clock/calendar option is not present, the file server has no clock, and the date will not be updated at midnight unless you change the date using the SET DATE command described in Section 4.4.2.

Note: If a clock/calendar card is present in your system, but the ENTER DATE prompt appears anyway, date and time have been set incorrectly in the card, or the card is not functioning properly. Supply the date, then type QUIT to leave NFS and execute CLOCKSET to set the proper date in the clock/calendar card.

NFS does not ask for a console password when booting; the default is that no console password is necessary. Use the PASSWORD console command to set or change the console password. Console passwords are discussed in Section 4.2.

NFS does not ask whether the console display is to be on or off (see section 4.3). The default is off. Use the console DISPLAY command discussed in Section 4.4 to turn on the console display. The system console will then display file server commands being processed.

The Network File Server will now complete its initialization.

4.2 System Console Passwords

A console password may be set to prevent unauthorized users from issuing console commands to the file server.

When a console password has been set, it must be entered before each console command. The console password and

console commands are entered in the following sequence:

- press the <esc> key
- type the exact console password
- press <return>
- type the console command and <return>

If the password sequence is entered incorrectly, it may be restarted by pressing the <esc> key. Until a valid password is entered by the above procedure, the file server will not accept console commands and will continue to service network requests. The password being entered is not shown on the console display.

To set a password at startup or at any time during operation, use the console command PASSWORD. By using this command, console passwords may be set, disabled, or changed without stopping the file server. To set the console password enter

```
PASSWORD PPPPP <RETURN>
```

where PPPPP is the desired password (up to 16 characters). The PASSWORD command is protected with the current password if one is in effect.

When PASSWORD password <return> is entered, the password will remain displayed. This will allow the System Manager to confirm that the password has been entered correctly. To then clear the screen, the password must be employed by entering

```
<esc>password<return><return>
```

That is, enter the current password, followed by a null command.

To turn off console password protection enter PASSWORD <return>.

4.3 The System Console Display

During normal operation, the Network File Server (NFS) displays the status of the network on the bottom half of the console screen as in the following example:

NESTAR SYSTEMS CLUSTER/ONE MODEL A

```
STN ACT TIM INT CHK ADR LEN
```

```

03      !
22      "
05
10
02 CR
55
CN                                     1.1

```

When NFS is not busy answering a network request the A in 'MODEL A' will have a blinking cursor over it. Otherwise, the cursor is elsewhere on the screen updating the network status information. When hard disk operations are in progress, a reverse-video D will appear in the lower left corner of the screen. The software version number (1.1 in the example above) is displayed in the lower right corner.

Beneath the letters STN is a list (in hexadecimal) of the numbers of the stations it has recognized. If there are more than six stations talking to the file server, then NFS displays the six most recently active stations. The display line whose label is CN (connecting) represents stations which have just begun to transmit and whose identities are not yet known.

Next to the station numbers are five events that can occur between NFS and a station. They are:

ACT indicates which station is currently ACTIVely communicating with NFS

TIM indicates that NFS detected a TIME-out while talking with a station

INT indicates that NFS encountered network INTERference while connected to a station

CHK indicates that the 16-bit error CHecKsum failed on a network packet

ADR indicates that an ADdReSSing error occurred, i.e. that NFS thought it was talking to a station with a different number

LEN indicates that a user station has tried to send a message or packet that is too long.

Beneath the ACT heading, characters are displayed next to the station NFS is currently connected to, otherwise it is

blank. NFS displays one or two characters when a connection is active. C indicates a connection has been made. The C can be followed by either a R for receiving a message or S for sending a message. For example, in the sample screen shown above, station 02 is currently connected to NFS, and NFS is receiving a message from the station.

Beneath each of the five error headings (TIM, INT, CHK, ADR, LEN) is a character indicating how many times that particular error has occurred since the last time the screen was rewritten (see RESET and CLEAR in Section 4.4.2). NFS starts with the character <space> denoting zero errors and increments it once upon each new occurrence of the error. (See the Apple II Reference Manual for a listing of the Apple character set.) For example, in the sample screen shown above, station 03 has encountered one time-out, and station 22 has had two interference errors. Upon occurrence of any of these errors, NFS will retry the transmission until the problem is remedied or the situation appears hopeless. Since error recovery procedures are automatically initiated, this part of the display is mostly for information purposes. However, continually changing characters in any of the error columns indicates that there is a problem with the network that should be investigated.

If the console display is on (see initialization above and DISPLAY console command in Section 4.4.2), the top half of the system console screen displays the most recently executed file server command and its return code and message:

```
nn--> Network Command
nn <-- rr,return message
```

where nn is the station number of the station that originated the command.

The console display may be reinitialized by entering the console command CLEAR.

The system console can also be used as a network station to enter file server commands. In general all of the commands that are available to ordinary network stations may be entered at the system console. There is also a set of privileged commands which are only accepted at the system console (Section 4.4).

The format and details of I/O errors that can occur at the system console are presented in Appendix A.

4.3.1 Bringing Down the File Server

To bring down the file server:

- (a) /MAIN must be present
- (b) Type QUIT.
- (c) Offline utilities may now be run.
- (d) If powering off harddisks, run the offline utility HDISK.
- (e) Error messages:

if EXEC ERROR #n, see RESET command below
(Section 4.4.2).

if DISKERROR X Y see Appendix A (Error Messages).
Run FILCHECK if necessary.

4.4 System Console Commands

Network Commands which can be used at the system console:

All Network Commands (CREATE, DELETE, etc.)
except BSAVE, BLOAD, BRUN and OFF.

Privileged commands used only at the system console:

CLEAR
DISK CHANGE
DISPLAY on/off
QUIT
RESET
SET DATE
SHOW ALL MOUNTS
SUPER cmd
TRACE on/off
\$nn cmd

Commands are entered at the system console by simply typing them in, preceded by the console password if one was set (see Section 4.2). No prompt or cursor will appear, however, until after the first character has been typed. Then the prompt:

ENTER CMD?

will appear on the first line of the console screen, followed by the character you just typed. Finish typing in the command and follow it by <return>. The command will execute and then print the error code and error message on the screen.

It is very important to realize that during the time the

file server is accepting commands being typed in at the system console, and executing those commands, the file server is not responding to any network requests. Since network requests are automatically retried for processing when the file server is not busy, none are missed, but system console commands should be used very judiciously so that they do not affect system response time.

4.4.1 Using File Server Commands at the System Console.

All of the standard file server commands (except BSAVE, BLOAD, BRUN and OFF) may be used at the system console. For instance, the console user can CREATE, MOUNT, DELETE, and PROTECT file server Files and directories. With the \$nn and SUPER prefixes, the console can be used to enter commands for other network stations.

4.4.2 Privileged Console Commands.

Listed on the following pages are descriptions of the privileged console commands.

CLEAR

CLEAR

-clear system console display

Parameters and Defaults

none

Error Messages

none

Access Rights Required

none

Discussion

CLEAR rewrites the system console screen and in so doing resets all the error counts (TIM, INT, CHK, ADR, and LEN).

DISK CHANGE Uu

-allows safe removal and insertion of Nestar floppy disks

Parameters and Defaults

u: unit number indicating floppy disk to be changed (1 or 2)

Error Messages

4, ILLEGAL DRIVE NUMBER

Discussion

DISK CHANGE allows safe removal and insertion of floppy disks in the Nestar floppy disk drives. The file server will safely recover from the removal of floppy disks at any time, but to do so it must assume that the actual floppy in the drive has been changed. This requires the file server to UNMOUNT NFS Files mounted on that floppy disk drive by user stations. Also, any currently outstanding SET DIRS to that floppy disk drive will be invalidated. Thus, disk removal or replacement can have unexpected effects on network users who may be using the disk in question. The DISK CHANGE console command is used to prevent these problems.

After entering the DISK CHANGE command the system responds with the message:

```
n FILES ARE OPEN ON DISK UNIT u
CHANGE DISK? (Y/N):
```

indicating how many files on the floppy disk drive in question are being used. This message is just informational; the disk may be changed even if files are open on it, but those files will no longer be accessible by their current users. The console user may respond with 'N' to abort the command. If 'Y' is typed the system prints:

```
INSERT NEW DISK IN DISK UNIT u
THEN PRESS <CR>
```

The disk may now be changed. Be sure to type <cr> to signal completion of the change and to allow the file server to accept network requests again.

If DISK CHANGE is not used when inserting a new disk (not recommended) then you should enter a SHOW VOLS command to (1) verify the disk can be read and (2) allow users to access the new disk by unit name rather than by unit number.

DISPLAY

DISPLAY switch

-turns the console display off or on

Parameters and Defaults

switch: the keyword 'OFF' or 'ON'. Default is OFF.

Error Messages

none

Discussion

The top half of the console display is used to show current command activity being handled by the file server. This display is turned on by entering DISPLAY ON; and turned off by DISPLAY OFF. The default when the NFS starts is display off.

Note that having the console display enabled (DISPLAY ON) has an effect on system performance. In normal operation the file server will run faster if the display is off.

PASSWORD [pw]

-sets console password

Parameters and Defaults

Default is no password. Passwords are subject to the same restrictions as pathnames: 1-15 characters; no commas, command characters, slashes, colons, carriage returns, or unprintable characters. Imbedded blanks are ok.

Error Messages

none

Discussion

The console password may be set, disabled, or changed without bringing down the file server, by using the console command PASSWORD. To set the console password enter PASSWORD ppppp where ppppp is the desired password. Console commands are then not allowed unless the console password is entered. The password command is protected with the current password if one is in effect.

To use the console password to enter a console command:

- press the <esc> key
- type the exact console password
- press <return>
- type the console command and <return>

If the password sequence is entered incorrectly, it may be restarted by pressing the <esc> key. Until a valid password is entered by the above procedure, the file server will not accept console commands and will continue to service network requests. The password being entered is not shown on the console display. To turn off console password protection enter PASSWORD <return>.

When

PASSWORD password <return>

is entered, the password will remain displayed. This will allow the system manager to confirm that the password has been entered correctly. To then clear the screen, enter a null command. The password must be employed by entering

<esc> password <return><return>

QUIT

QUIT

-quit the Nestar File Server

Parameters and Defaults

none

Error Messages

none

Discussion

QUIT instructs the file server to halt operation. All of the user's volumes that are currently mounted are unmounted. Hence, this command should only be used when the system is shut down. The Pascal environment is re-entered and the Network File Server or Disk Utilities may be executed.

To bring down the system completely, execute the HDISK utility program to power down any hard disks present. Switch off the hard and floppy disks. Switch off the file-server Apple. Complete power down is not necessary unless the system is to be moved.

RESET

-reset Network File Server

Parameters and Defaults

none

Error Messages

none

Discussion

The file server takes over the Apple reset button when it is running. Hitting <reset> at any time will cause the computer to enter the Apple monitor. Should this happen accidentally, typing the character G, followed by <carriage return> will cause the file server to attempt to resume operation; provided <reset> was not hit during a network transaction or disk access (see below). All MOUNTS, LOCKS and SET DIRs will be preserved. This sequence causes the display to be re-written.

The <reset> key should not generally be used. There is, however, one exceptional situation under which it may be required. If one of the Nestar hard disk drives becomes not ready, use of the <reset> button will restore it to operation. (You can tell if a disk is not ready by entering LIST /5 or /6 as a console command, which will return 133,DISK NOT READY.)

If it is necessary to use the <reset> button, care must be taken to assure that the file server is not part way through a network transaction or disk access. If this is not done, the file server's data structures may be irreparably damaged. To avoid this you should enter a console command, BUT NOT HIT CARRIAGE RETURN, before pressing <reset>. It is suggested that the console command used be RESET. This command has no other purpose than to freeze the file server so that it is not in the middle of a transaction. The <reset> button may now be used.

If the file server detects a run-time error the display will show:

```
EXEC ERROR #n
S #s, P#p, I#i
TYPE <SPACE> TO CONTINUE
```

If this happens, record exactly the full contents of the file server's display (for transmittal to Nestar), press the

RESET

<reset> button, and enter C600G followed by <return> to reboot the system. Then, restart the file server (see Section 5.1). The file server's data structures are in an unknown state after a run-time error and the file server should not be allowed to continue running.

SET DATE yymmdd

-sets the system date when no clock/calendar card is present

Parameters and Defaults

yymmdd: the date is given as a sequence of six digits
yymmdd; yy for the year, mm for the month, and dd
for the day. No intervening characters such as / or
- are allowed.

Error Messages

3,UNRECOGNIZED PARAMETER

Discussion

Sets the system date to the value given. The system date is used to mark files and directories with times of creation, last access, last modification and last backup. The system date is also displayed on network stations in response to the SHOW DATE command.

Never enter a date prior to the current actual date. Doing so can cause the internal file system information regarding the date a Network File was last modified to be incorrect. Unless a clock/calendar card is present, the file server has no clock; consequently the date will not be updated unless you change the date using this command.

If your system uses a clock/calendar card and the SET DATE command is issued, the error message 3,UNRECOGNIZED PARAMETER will be returned.

Example

If you wish to set the current date to July 3, 1981, enter the command 'SET DATE 810703'.

SHOW ALL MOUNTS

SHOW ALL MOUNTS

-display all mounts of all stations using this file server

Parameters and Defaults

none

Error Messages

none

Discussion

This command displays the same information as SHOW MOUNTS but does so for the system as a whole. All current mounts on the file server are displayed.

This command may cause many lines of display to be written. You can temporarily freeze the display by pressing ctrl-S once; be sure to enter ctrl-S again to unfreeze the display, and allow normal system operation to continue. If the final state of the screen is unsatisfactory the CLEAR command can be used to clean it up.

Examples

SHOW ALL MOUNTS would generate a screen similar to the one pictured below:

NAME	DRV	ACCESS	T	VOL	SIZE	STN	USE
/MAIN/PASCAL/LIB							
	5	RO,SHR	P	0	280B	02	2
/MAIN/USERS/ME							
	4	RW,EXC	D	32	455S	41	1
/FLOPPY/STUFF							
	27	RW,SHR	D	0	455S	41	1
/MAIN/PASCAL/LIB							
	9	RO,SHR	P	0	280B	03	2

SUPER cmd

-overrides file server passwords on Network files.

Parameters and Defaults

none

Error Messages

none

Access Rights Required

none

Discussion

The prefix SUPER may be used with console commands to override file server passwords on Network files. The scope of the SUPER prefix is limited to the command entered on the same line. All password protection on files is overridden during a SUPER command. This may be useful for changing forgotten file passwords, etc. The console password should be set in environments where SUPER might be misused.

The station number (\$nn) and super prefixes may be used together in a console command if the station number prefix is entered first: \$nn SUPER cmd.

TRACE switch

TRACE switch

-turns on or off NFS trace mode

Parameters and Defaults

switch: the keyword 'ON' or 'OFF'. Trace default is off.

Error Messages

none

Discussion

This command turns on or off NFS trace mode (default is off). If trace is on and the NFS file /MAIN/SYSTEM/TRACE is present, then NFS commands are traced by writing a record on that file for each NFS command executed. The trace records are entered round robin in the trace file: one sector per command, containing the timestamp, originating station number and actual command. The trace automatically wraps around the end of the trace file.

The file /MAIN/SYSTEM/TRACE may be created by the system manager by X(ecuting FILDEBUG (Sec. 5.4) on the file server station. Go to F(ile) mode and enter

CREATE /MAIN/SYSTEM/TRACE

Respond to the TYPE? question with S, and to the size question with 25 (suggested size; for more or fewer trace records than 25 enter corresponding number of sectors.)

Trace files may be analyzed using the TRACE program run on a Pascal user station.

Note that TRACE records may contain user-entered file protection passwords. Because of this, /MAIN/SYSTEM/TRACE should be protected from public access by entering

PROTECT /MAIN/SYSTEM/TRACE,PUBACC=,GRPACC=,PRVPW=xxx

at the system console as soon as NFS is started after creating the trace file in FILDEBUG.

\$nn cmd

-execute a command for a network user station

(replaces Release 1.0 STATION command)

Parameters and Defaults

nn: station number to be simulated must be between \$1 and \$7F. Number must be entered in hex preceded by a '\$'.

Error Messages

1, ILLEGAL COMMAND
5, ILLEGAL STATION NUMBER

Discussion

The \$nn cmd command allows the system console to simulate network requests of other network stations. This causes the file server to execute the entered command as if it had been sent over the network from station nn. This command should be used very carefully, since its use may affect the operation of a user station in ways that the user does not expect. The commands BLOAD, BSAVE, BRUN, and OFF cannot be simulated using the \$nn cmd command.

The station number and super prefixes may be used together in a console command if the station number prefix is entered first: \$nn SUPER cmd.

Examples

This command is helpful, for example, if a user is running the Pascal editor and discovers that there is not enough room to write out the file being edited. The System Manager can enter the following on the system console:

\$03 MOUNT /MAIN/EMPTYDISK,D9,RW

where \$03, in this example, is the user's station number. The file could then be written out to EMPTYDISK, where EMPTYDISK can be any Pascal virtual diskette on the system.

Similarly, \$nn cmd is useful for unlocking locks held by stations that have caused a deadlock, mounting a virtual disk SHaRed rather than EXclusive, etc.

Chapter 5

NFS Disk Utility Programs

A set of file server utility programs is provided with the Cluster/One Model A system. The programs are used by the System Manager for maintenance of the file system and file server resources. The utilities are supplied as part of the system disk 'MAIN' (Boot Version 1.1) (see diskette map, Section 3.2)

Offline utilities run on the file server and are located on the virtual diskette /MAIN/SYSTEM/BOOT. Disk utilities cannot be run while other file server operations are in progress.

Online utilities are run on a user station (by the System Manager) while the file server is in operation. Online utilities are located on /MAIN/PASCAL/LIB (ZAPPASCAL and SETPROFILE) and on /UTILS/DOS/3.2.1 and /UTILS/DOS/3.3 (SETPROFILE). If desired, the SETPROFILE programs can be made available for use by normal users.

Other online utilities are described in Chapters 7 and 8 of the User Manual.

FORMAT is an offline utility used to initialize new diskettes prior to their use in the Network File Server. This must be done to diskettes as they come from the package, or disk errors will occur. Hard disks are shipped already formatted, and should not be reformatted.

DISKCOPY is an offline utility used to copy entire volumes of data between media which are of identical size. Generally it is used to provide a simple means of backing up diskettes in their entirety.

FILTRAN is an offline utility used to copy data from one disk location to another. It can copy selected portions of the file system from diskette to diskette, hard disk to diskette, etc. Off-line backup and structural changes in the Network File Server hierarchy can be accomplished using this utility.

FILCHECK is an offline utility program that can be used to verify and manipulate the state of Nestar hard disks and diskettes.

UTILITIES

HDISK is an offline utility program that can be used to sequence down a hard disk prior to turning off the disk.

FILDEBUG is an offline maintenance and diagnostic utility that can be used by the System Manager for a variety of disk maintenance purposes.

ZAPPASCAL is an online user-station utility program that can be used by the System Manager to modify the SYSTEM.PASCAL on any virtual diskette so that certain files that normally come from the booted volume can come from a virtual volume on #5 instead.

SETPROFILE is an online utility program used to specify to the BOOT program which NFS volume is to be automatically booted from at individual stations.

5.1 FORMAT

FORMAT is an offline utility program that cannot be run while other file server operations are in progress.

All new floppy diskettes which are to be used with the Network File Server (except the diskettes supplied by Nestar with the original system) must be initialized by FORMAT prior to use.

FORMAT first writes special record information on each track of the diskette. It then verifies that the diskette is usable, by writing and reading data throughout the entire diskette. During this phase errors may be reported on the console screen. A new diskette should have no permanent errors; in fact, retries should not occur when verifying high quality new diskettes.

FORMAT also writes special system initialization data on the diskette, recording the size of the diskette, its name, etc. Only when all these steps have been successfully completed can a diskette be used for storage of data on the Cluster/One Model A.

If FORMAT reports errors, try removing the diskette, reinserting it, and formatting it again. One of the most common problems is trying to format a diskette which is write protected. Eight inch floppy diskettes have a notch REMOVED when they are write protected, and covered in order to write. (This is the opposite convention from that used for 5 1/4" minifloppies.) See Appendix A for a description of how to write-protect floppy diskettes. Should the condition persist, attempt to format using the other disk drive. If diskettes can be formatted on one drive but not the other, the latter drive should be scheduled for service. If you can format diskettes, but a particular diskette gives error indications, return the diskette and get a replacement. Disks with permanent errors have some manufacturing or handling defect, and are not usable.

FORMAT will accept either single-sided or double-sided floppy diskettes. You should use diskettes intended for single or double density, soft sector operation. The number of sectors or sector size is immaterial, since the FORMAT program will ensure that this is made consistent with the Network File Server requirements. The disk drives used in the Cluster/One Model A file server have two read and write heads, and will automatically utilize both sides of a floppy diskette which is specified for this purpose. Do not be use 'flip over' diskettes, which are meant for drives which read and write only one side at a time, and are intended for manual flipping. These two types of diskette

FORMAT

can be visually distinguished by the number of small round holes punched near the wide slot in the diskette jacket. 'Flip-over' diskettes have two holes punched, one on each side of the wide slot. True double-headed diskettes have only one hole, as do standard single-sided diskettes.

Hard disks may be formatted with the controller in slots 2 or 3 (units 5 or 6) and both 16.5 and 33 MB disks are supported. (N.B.: Hard disks are shipped already formatted. Under normal circumstances there should be no need to reformat a hard disk.)

The date of formatting is written in the device header.

5.1.1 How to Use FORMAT

THE FORMAT PROGRAM WILL CAUSE ANY DATA ALREADY ON THE DISK TO BECOME INACCESSABLE, AND GIVE YOU A FRESH EMPTY DISK. BE SURE THIS IS WHAT YOU WISH TO DO BEFORE FORMATTING A DISK. HARDDISKS ARE FORMATTED AT THE FACTORY AND SHOULD NOT NORMALLY BE REFORMATTED.

1. Turn on the system, as described in Section 4.1, and avoid chaining to the Network File Server by pressing the <escape> key when prompted. If the File Server is in operation, type QUIT <cr>. In either case, when the Pascal command line comes up, type 'X' for X(ecute).

2. When you are prompted:

EXECUTE WHAT FILE?

reply with 'FORMAT' (and press <return>).

3. The next prompt will be:

ENTER DRIVE NUMBER (1..2 or 5..6):

You must enter one of these numbers, followed by <return>. You should never reformat drives 5 or 6, the hard disk units. This has been done by Nestar prior to shipping the hard disk units to you. The drive 5/6 option is for use by Service Representatives only.

At this time you should enter the number '1' (for the LEFT floppy disk drive) or '2' (for the RIGHT floppy disk drive).

4. Now the system will test to see if the diskette inserted in the specified drive is single or double sided, and will display:

*** THIS IS A SINGLE SIDED DISK

or

*** THIS IS A DOUBLE SIDED DISK

as the case may be.

(If the system displays THIS IS A HARD DISK you should abort the procedure by pressing the escape key, followed by carriage return.)

5. You are now prompted with the message:

ENTER Y TO PHYSICALLY FORMAT
THE DISK (Y/N)?

For a fresh diskette you must reply with 'Y' to cause the physical formatting information to be written correctly. This will destroy any data previous recorded on this disk.

If FORMAT recognizes the diskette you are about to format as a formatted Nestar volume, it will ask

OK TO DESTROY "name" (Y/N)?

where "name" is the existing name of the volume. Respond Y if you wish to proceed, and all contents of the disk will be erased. Enter N to abort the operation.

During the actual formatting process, a dot will be printed on the screen for each of the 77 tracks on the disk. Any errors will be shown on the console. Should you get a flurry of errors you can press the <esc> key to abort the entire operation at this time, and inspect the disk.

Entering 'N' in response to the PHYSICALLY FORMAT prompt proceeds to the next step.

6. You are now prompted with the message:

ENTER Y TO VERIFY ALL DATA
ON THE DISK (Y/N)?

Again, for a fresh disk, you MUST verify the correctness of the formatted area of the disk, by replying 'Y'. It is possible that some errors may occur, due to problems in writing the actual physical format information during step 6. If one or two errors occur during this phase, go back and reformat the entire disk again, including

FORMAT

step 6. This may cure the problem. In no case use a disk which has permanent errors reported during the VERIFY phase of this program.

You may also press <esc> while the dots are being typed for each track during verification if you need to abort and start over.

7. You are now prompted with the message:

```
ENTER Y TO INITIALIZE THE DISK  
ROOT DIRECTORY (Y/N)?
```

Type 'Y', and FORMAT will prompt you with

```
ENTER DISK ID:
```

You should now type in a volume name which will be used to identify this disk to the Network File Server, and which can be specified by users in their disk requests. This name can be up to 15 characters long (however, do not use "/"). After formatting successfully, you should write the date and the name you supplied on the label of the diskette. Make sure to use a felt tip pen, and never use a pencil or ball point pen. They may damage the diskette medium. The date is an important item to note on the diskette as well. Floppy diskettes will wear out in normal use. You should consult the manufacturer's specifications of the diskettes you are using to be sure that you periodically replace diskettes in use by new diskettes, and retire work diskettes in a conservative fashion. It is easy to be lulled into a sense of security due to the extensive error recovery features designed into the Cluster/One Model A system; but when a diskette contains unreadable data (or cannot be written) there is absolutely nothing that can be done. You must perform regular backups using DISKCOPY or FILTRAN.

As in 5. above, if FORMAT recognizes the diskette as a Nestar-formatted volume, it will ask

```
OK TO DESTROY "name" (Y/N)?
```

Format will record the ID name you supply, and will perform other important system initialization tasks in the root directory for this diskette. During this time the screen will display a series of dots again, following by the message:

```
DIRECTORY STRUCTURE INITIALIZED.
```

Type 'N' to the message ENTER Y TO INITIALIZE... only if you realize that you have made a mistake and wish to skip to the end of the program in order to begin again. A diskette that does not have correct directory information will not be usable in the Nestar File System.

Any messages other than those described above should be recorded, and if the problem persists, reported to Nestar.

NOTE: There are occasional circumstances when you have just formatted and verified a diskette, and decide that you need to change the volume identification. In this case only, you may reply 'N' to both steps 5 and 6, skipping those operations, and causing only the fresh directory information to be recorded. Remember, however, that this operation removes all files from the disk. If you wish to change the name of a disk without removing the files, use the FILDEBUG utility (Section 5.6).

8. You will now be prompted with the message:

DO YOU WANT TO FORMAT
ANOTHER DISK (Y/N)?

Answering with 'Y' will allow you to format additional floppy disks. A reply of 'N' returns you to the command level of Pascal. To execute the Network File Server, type 'X' for 'execute', then 'NFS'.

5.1.2 How to Abort FORMAT

Whenever the FORMAT program requests a reply from you, you may elect to abort the current stage of formatting, and start from the beginning of the program. This is done by pressing the <esc> and then <return> keys in succession.

Before you do this, be sure that the boot volume (hard disk or floppy diskette) is available in the drive you booted from.

DISKCOPY

5.2 DISKCOPY

DISKCOPY is an offline utility program used to make a full copy of one diskette or hard disk to another already formatted diskette or hard disk. It should be used periodically to preserve copies of your programs and data. Should a diskette become damaged by handling or normal wear, it may be impossible to recover the data from it, at which time a backup copy is invaluable.

DISKCOPY will copy from floppy diskette to floppy diskette, or hard disk to hard disk. The sizes of source and target must be identical:

single-sided floppy to single-sided floppy
double-sided floppy to double-sided floppy
16.5 MB harddisk to 16.5 MB harddisk
33 MB harddisk to 33 MB harddisk

DISKCOPY will permit you to select the volume name of the target disk you are creating. This name can be chosen to be the name previously recorded on the target, to be the name recorded on the source volume, or to be a new name that you enter from the keyboard (the "/" symbol is not allowed).

DISKCOPY does not preserve any of the files which may already be present on the target disk. They are totally replaced by an exact image copy of the entire source disk. For a more selective form of backup and copy procedures, you should refer to the section on FILTRAN, which provides more flexible control over copying subsections of disks, renaming NFS Files as they are being copied, and preserving the existing files on a target disk.

5.2.1 How to Use DISKCOPY

1. If NFS is currently running, type QUIT <return>. Otherwise, start up as described in Section 4.1; avoid chaining to the NFS program by pressing the escape key when prompted. In either case, from the Pascal command level, type X (for X(ecute)).

2. When you are prompted:

EXECUTE WHAT FILE?

reply with 'DISKCOPY' (and press <return>).

3. You will then see the Nestar logo and three lines:

[Enter <esc><cr> to abort at any time]

READY DISKS FOR COPYING

ENTER SOURCE DISK NUMBER:

Source and target numbers are

source	target	
1	=> 2	floppy disks
2	=> 1	floppy disks
5	=> 6	hard disks
6	=> 5	hard disks

If you wish to copy from one floppy to another, place the source (i.e. diskette you wish to copy from) and target (i.e. diskette you wish to copy to) in the two floppy disk drives, and close the drive doors. You should then enter, in response to the prompt 'Enter Source Disk Number', the number '1' if the disk you wish to copy from is in the leftmost disk drive, or '2' if it is in the righthand drive. If you are copying from a hard disk, enter its unit number.

When you see the prompt:

ENTER TARGET DISK NUMBER:

enter the drive number of the disk you wish to create by DISKCOPY.

- At this time, the system will read the directory information from the two disks you have inserted or specified. Several checks are made to ensure that these are valid Network File Server disks. Once this is completed, DISKCOPY will display:

```
*** Source is: MASTER1
*** Size = 2464S
```

```
*** Target is: MASTER.BAK
*** Size = 2464S
```

(Of course the actual display will show the names of the disks you have inserted or specified in place of MASTER1 and MASTER.BAK, and the sizes should be 2464S for double-sided disk, 1232S for single-sided disks, 63840S for 16.5 megabyte harddisks, and 127680S for 33 megabyte harddisks.)

- Then you see the prompt:

KEEP TARGET NAME: MASTER.BAK (Y/N)?

replying 'Y' will cause all the data from the source to be copied to the target, while preserving the name of the

DISKCOPY

target disk.

If you reply 'N', you will see the prompt

KEEP SOURCE NAME: MASTER1 (Y/N)?

Replying 'Y' will cause the copy to have the same name as the original disk being copied.

If you reply 'N' again, you will see the prompt

ENTER NEW NAME (MAX. 15 CHARS)

:

to which you can supply a new name, different from the current name of either of the two disks you are copying.

6. Once you have satisfactorily supplied a name as required in Step 5, DISKCOPY will proceed to copy the entire source to target. It will keep you informed of its progress by displaying the current range of data it is copying, and the total amount to be copied.

There is nothing more for you to enter, until you see the prompt:

DO YOU WANT TO COPY
ANOTHER DISK (Y/N)?

If you wish to exit DISKCOPY, enter 'N'; otherwise to begin again enter 'Y', which will reprompt you as described above in step three.

It takes approximately 25 minutes to copy an entire 16.5 MB hard disk to another, and to verify the result.

5.2.2 How to Abort DISKCOPY

Whenever DISKCOPY requests a reply from you, you may elect to abort the current stage of copying, and start from the beginning of the program. This is done by pressing the <esc> and the <return> keys in succession.

It is also possible to abort during the data copying phase, by pressing the <esc> key (only). If you do so, you must reinitialize the target disk using FORMAT, or else recopy a source disk to the target using DISKCOPY successfully. The information on the target disk is inconsistent if you exit during the copying process, and can cause a variety of unpredictable effects. Never use such a disk without using FORMAT to create a new empty directory.

5.3 FILTRAN

FILTRAN is the File Transfer Utility. It is an offline utility program that runs on the file server Apple. Its basic function is to copy files and directory structures from one physical device (the SOURCE) to another (the DESTINATION). FILTRAN will copy from any unit to any other unit. FILTRAN can be used for the following tasks:

1. Copying an entire floppy diskette to a hard disk.
2. Copying part of a hard disk to a floppy disk to create a backup or to transport data to another site.
3. Copying from one floppy diskette to another, even if the physical sizes differ (one-sided vs. two-sided).
4. Copying a single file or directory sub-hierarchy from one device to another.
5. Copying from a hard disk of any size to another hard disk.

5.3.1 Limitations

FILTRAN will not copy any file which is larger than the physical medium used as the destination. In particular, a large virtual PASCAL volume on the hard disk cannot be copied to a floppy disk if it is larger than about 600 blocks for a single-sided disk, or 1200 blocks for a double-sided disk.

5.3.2 How to Use FILTRAN

1. Turn on the file server Apple and avoid chaining to the Network File Server program by pressing <esc> when prompted. If NFS is in operation, type 'QUIT' <cr>. From the Pascal command level, type 'X' (for X(ecute)).
2. When you are prompted:

EXECUTE WHAT FILE?

reply with 'FILTRAN' (and press <return>).
3. The first question to be answered is what file or directory structure is to be copied:

```
ENTER SOURCE PATH
(USE /N FOR ENTIRE UNIT)
:
```


FILTRAN

Enter the full path name, starting with the drive number or volume name, of the file or directory to be copied. For example, enter:

/1	to copy all of floppy disk 1
/1/USER/FDR	to copy all the files in FDR's directory
/1/USER/FDR/DOS	to copy only the file DOS (assuming it is not itself a directory)

FILTRAN will check the directory and determine the type of object you are trying to copy, so the disk should be ready (the disk inserted and the door closed, in the case of a floppy disk) before you answer this question.

FILTRAN is a privileged system utility and has the ability to inhibit the normal password and access control. You will not be refused access to any file on the source, or asked to supply any passwords in any pathname. (Since FILTRAN can only be run on the file server Apple, this does not represent a breach of security). Files created on the destination will, with the exception of implicitly created directories as noted below, have all the passwords and access rights of the original.

The escape key can be used to abort a copy in progress. Pressing ESC in the middle of a copy will cause FILTRAN to ask whether you want the file copy complete before aborting.

5.3.2.1 Copying Single Files

In the simple case where a file (rather than a directory) has been specified, you will be asked:

ENTER DESTINATION NAME
:

and you simply enter the path name that you want for the new file, again starting with the drive number or volume name. For example,

/MAIN/FDR/OLDDOS

The pathname can be a sequence of directory names, and any directories which do not yet exist will be created. If the file already exists, you will be asked:

ERASE DUPLICATE (Y/N)?

If you say 'Y', then the existing file will be deleted, and the new file created in its place. If you say 'N', then you get a chance to change disks or to respecify the name:

CREATED PATHNAME WILL BE:

/5/USERS/FDR/OLDDOS

OK (Y/N)?

If you say 'Y', then it tries again with the same name, which is useful if the destination is a floppy disk and you have changed the disk. If you say 'N', then it asks for a new name:

ENTER NEW PATHNAME OF FILE

:

Enter a new name (on any physical volume) and FILTRAN will try again.

5.3.2.2 Copying Directory Structures

In the case where the SOURCE path specifies a directory (rather than a file), you will be asked

ENTER PREFIX FOR DESTINATION FILES
(USE "/N" FOR ROOT)

:

Enter the initial part of the pathname that you wish all of the copied directories and files to have. The pathname you specify is the name of the directory in which entries will be made for the objects at the top level of the SOURCE.

For example, suppose you have specified /1/USER as the SOURCE, and the directory structure is

```

/1/USER
  /FILE1
  /DIRECTORY
    /FILE2
    /FILE3
  /FILE4
...other files in /1/USER...

```

If you specify /5/USER/FDR as the DESTINATION, then the resulting file structure will be

```

/1/USER/FDR
...existing files in /1/USER/FDR...
/FILE1
/DIRECTORY
      /FILE2
      /FILE3
/FILE4

```

Note the general rule: files and directories underneath the specified SOURCE directory are copied and added to the DESTINATION directory. As usual, directories in the DESTINATION pathname may or may not already exist.

An important particular case of this general rule applies when you want to copy ALL of a physical disk and leave the directory structure intact. In that case both the SOURCE and DESTINATION specify only the root directory; for example using "/1" as the SOURCE and "/5" as the DESTINATION will copy all of floppy disk 1 into the hard disk at the top level. Any existing files or directories already at the top level will remain undisturbed, as will the name and attributes of the root directory.

After asking about the source and destination paths, FILTRAN will ask some question about how each directory or file is to be processed.

ASK ABOUT EACH FILE (Y/N)?

If you say 'Y', then each file or directory will be listed before it is copied, and you will get a chance to copy it or skip it. If you say 'N', then all files in the SOURCE structure will be copied, but in this case FILTRAN asks first how duplicate names should be handled.

ERASE DUPLICATES (Y/N)?

If you say 'Y', then a file which already exists on the DESTINATION with the same name as a file being created will be erased. (If a subtree of files is being copied and a non-empty duplicate directory is encountered, FILTRAN will use the existing directory rather than aborting because a non-empty directory cannot be deleted.) If you say N, then you are asked:

SKIP DUPLICATES (Y/N)?

If you say 'Y', then any file which can't be copied because the new name already exists will be skipped.

If you say 'N' to both the ERASE DUPLICATES and SKIP DUPLICATES questions, then you will be asked about each duplicate name as it arises. If you expect no duplicates, the prudent course is to answer 'N' to both these questions.

You will now be asked whether the "last backup" dates of the source files should be set to today's date (and time) to indicate that a backup was made:

UPDATE BACKUP DATES (Y/N)?

After these initial questions, FILTRAN will proceed to search the SOURCE structure and copy files to the DESTINATION. It announces each item name and size as it is processed:

FILE: /1/USER/FILE1,SIZE=212S

or

DIRECTORY: /1/USER/DIRECTORY,SIZE=3S

If you have asked to be asked about each item, then for files FILTRAN will ask:

COPY (Y/N)?

and you respond appropriately. If you say 'Y', then it shows the name and size of the file it is about to create, and gives you a chance to change its pathname.

CREATED PATHNAME WILL BE:
/5/USERS/FDR/FILE1,SIZE=212S
OK (Y/N)?

If you say 'Y' the file is created and copied, but if you say 'N' you are asked for the new name:

ENTER NEW PATHNAME OF FILE
:

The file is created and you are kept informed of the blocks being copied as the transfer progresses:

COPYING 110 TO 129 OF 1200

The units are in sectors (256 bytes), and since there are N+1 sectors in the range from 0 to N, the last message will look something like

COPYING 1180 TO 1199 OF 1200

If any errors are encountered in creating the file or

copying the data, the error message is reported and you are asked

OK TO SKIP IT (Y/N)?

If you say 'N', FILTRAN attempts to create and copy the file again; in the case of a floppy disk you may change the disk before the new attempt is made. If the original attempt failed because there was not enough room on the destination disk, you will be specifically prompted about using a new disk.

TRY AGAIN WITH NEW DISK (Y/N)?

When a directory is encountered in the source, and you wanted to be asked about each file, then you will be asked separately if you (a) want to create the directory now, in which case it will inherit all of the passwords and access rights of the original directory, and (b) if you want the directory searched.

CREATE THIS DIRECTORY (Y/N)?

SEARCH THIS DIRECTORY (Y/N)?

The questions are independent; for instance you may choose not to create the directory but to search it, because you will rename all of the files that are copied. Conversely, you may choose to create the directory (with all the passwords and access rights copied) but not search it to copy files that it currently contains.

If you do not choose to CREATE the directory when it asks, but do search it and copy some files with their original names, then the directory will be created implicitly in the normal fashion if it does not already exist. The difference is that the password and access rights will not be copied from the SOURCE, but rather implied from the file being copied.

5.3.3 Copying Network File Server Bootable Volumes

Virtual volumes from which the Network File Server can be booted have special identification information in the header record. After FILTRAN has copied a virtual volume which is identified as the boot virtual volume of the source volume, it asks whether you want the newly-created copy to be the boot virtual volume of the destination volume:

THIS IS THE BOOT PROGRAM OF THE

SOURCE DISK. SHOULD IT BE THE
BOOT PROGRAM OF THE DESTINATION (Y/N)?

If you intend to boot the system from the destination disk, you should answer 'Y'. The only reason to answer 'N' is if the destination disk already has an identified boot virtual disk that you do not want to disturb.

If a subtree of files is being copied without asking about each file, and a file which is the boot volume of the source is copied, then it will be made the boot volume of the destination without asking you about it. This allows an entire volume to be copied without asking any questions at all once the copy has started. If you later wish to change the boot volume of the destination disk, you can use the FILDEBUG utility to do so.

5.3.4 The Simple Special Cases

The question and answer dialog that is expected by FILTRAN is complicated to explain because there are many variations in the general problem of copying substructures of one directory hierarchy to another. Although an effort has been made to have it ask the relevant questions at the right place, it is important to note that there are three simple special cases which require only a few answers.

1. Copying an entire floppy disk to the hard disk or another floppy:

Specify "/" as the SOURCE, and "/5", "/6", or "/2" as the DESTINATION. Then answer N to the first three questions

```

ASK ABOUT EACH FILE (Y/N)? N
ERASE DUPLICATES      (Y/N)? N
SKIP DUPLICATES       (Y/N)? N
UPDATE BACKUP DATES (Y/N)? N

```

The entire disk will be copied and you will not be bothered for more responses unless something goes wrong.

2. Copy a single file from one disk to another:

Specify the full pathname of the file to be copied as the SOURCE, and the full pathname of the new file. You will be asked no other questions unless something goes wrong.

3. Copy a single file on the same disk

FILTRAN

FILTRAN can be used to copy or duplicate files on the same physical disk by simply using the same root directory for both source and destination.

FILCHECK

5.4 FILCHECK Utility Program

FILCHECK is an offline utility program that runs in the File Server Apple and can be used to verify the condition of Nestar hard disks and 8" floppy disks. Among its functions are:

- Reading all sectors on the disk, including control and directory sectors, user data, and freespace, to verify that all sectors are physically readable. Sectors which cannot be read may be rewritten.
- Reading and validating all control sectors (headers and file descriptors).
- Reading and validating all directory sectors starting with the root directory.
- Reading and validating all freespace descriptors.
- Reporting any orphaned sectors and optionally adding them to the freespace. (Orphaned sectors are those which are neither part of allocated files nor on the freelist, and may result from a File Server crash which occurred while directory information was being updated.)
- Recovering any lost freespace on some hard disks.

To run FILCHECK, boot the file server and X(ecute FILCHECK. It will ask

UNIT NUMBER?

to which you respond with 1, 2, 5, or 6. It then asks whether you want the data part of files and/or the unused parts of the disk to be read and physically checked.

CHECK DATA BLOCKS (Y/N)?

CHECK FREE BLOCKS (Y/N)?

Respond Y or N to each question. (The only reason to respond N is to save time in the execution of FILCHECK.)

FILCHECK will then begin its examination of the disk. As each file is processed, the full pathname will be printed. After all files and freespaces have been checked, summary information will be displayed. The program will take about 15 minutes to completely check a 16.5M harddisk and 30 minutes for a 33M disk. To check file structures only (and not freespace or data blocks) takes several minutes.

If any inconsistencies or structural errors are found, FILCHECK

will describe the problem and, in many cases, request permission to take some corrective action. The general description of the possible inconsistencies, the corrective actions, and the consequences, are beyond the scope of this document. However, in the case when the only reported error is orphaned blocks (also called "gaps"), then it is generally safe to allow FILCHECK to add any such blocks to the freespace.

5.5 HDISK Utility Program

HDISK is an offline utility program which runs in the File Server Apple and can be used to sequence down a hard disk prior to turning off the disk. It is recommended that the following procedure be used whenever the disk is to be shut off:

- Boot the File Server Apple (if not already running), and abort chaining to NFS by hitting <esc> when prompted. Enter the QUIT command if NFS is running.
- X(ecute HDISK
- Respond to the question "WHICH DISK UNIT?" with 5 or 6, as desired.
- Respond to the question "PU (powerup) or PD (powerdown)?" with PD to power down the disk. The disk heads will be retracted to a landing zone, the platter motor will be turned off, and the brake will be energized. After about 15 seconds, the program will exit.
- If you attempt to power down the hard disk from which the system was booted, the message

THAT IS THE BOOT DISK.
DO YOU MEAN TO STOP THE SYSTEM (Y/N)?

If you type Y and proceed, the disk will be powered down and the system will stop; you cannot then execute any more utilities until the system is rebooted.

- Turn off the main power switch to the hard disk. This should be done BEFORE turning off power to the Apple.

The HDISK utility can also be used to power up a disk after it has been powered down. Normally this is unnecessary since the reset which occurs when the Apple is powered up will also power up any hard disks which are attached.

5.6 FILDEBUG Utility Program

FILDEBUG is an offline utility program which runs in the File Server Apple and which can be used for a variety of disk maintenance purposes by the system manager. This description is an overview of some features of FILDEBUG which may be useful; more details will be published as necessary.

5.6.1 How to Run FILDEBUG

To run FILDEBUG, boot the File Server Apple and X(ecute FILDEBUG. Input is via a nested series of menus; at the outer level you have the choice of:

F(file) -- File system submode allows you to issue a variety of NFS-like commands to manipulate disk structures.

D(isk) -- Disk submode allows arbitrary disk sectors to be read or written from any supported unit (hard disk or 8" floppy).

M(emory) -- Memory submode allows you to read or write any part of the Apple memory. This is most frequently useful for modifying data in disk sector buffers. The default values for address and length will correspond to the last disk operation performed.

I(nfo) -- Information about buffers within FILDEBUG are displayed.

Q(uit) -- Return to the Pascal-level command prompt.

The F(file) submode prompts with "Command?" and has a large number of commands available. The HELP command will list most of the available commands, but you are encouraged to restrict your use to the examples shown below unless you get further information from Nestar. Note that some of the commands (such as CREATE) differ from their NFS equivalents in the way that information is supplied.

FILDEBUG F(file) mode examples

(1) Renaming a disk volume

```
Command? RENAME /5
NEW NAME FOR MAIN (CR TO EXIT): NEWDISK
DO YOU MEAN TO RENAME THE DISK? Y
```

OK
UNIT 5: NEWDISK?
Command?

(2) Changing the file (virtual Pascal volume) which is to be booted by the File Server Apple

Command? SETBOOT /6/PASCAL/BOOT
OK

(3) Deleting a file

Command? DELETE /MAIN/USERS/LJS/JUNK
OK

(4) Creating a file

Command? CREATE /MAIN/USERS/LJS/NEWJUNK
SIZE IN SECTORS? 100
TYPE (SINGLE LETTER)? B
OK

(5) Listing a directory

Command? LIST /MAIN/USERS/LJS
/MAIN/USERS/LJS
DOCUMENTS ,T=P,SZ=2401S
MAIL,T=P,SZ=204S
...etc...

5.7 ZAPPASCAL Utility Program

ZAPPASCAL is an online system utility program that runs on a network user station. It can be used by the system manager to modify the SYSTEM.PASCAL on any virtual volume so that certain system files which normally must be on the booted volume can come from a shared disk on #5: instead. Any user station which boots using the modified SYSTEM.PASCAL will see these changes.

In particular, the following three files can be affected:

<u>Original name</u>	<u>New name</u>	<u>Function</u>
*SYSTEM.STARTUP	#5:NESTAR.START	Program executed when booting
*SYSTEM.LIBRARY	#5:NESTAR.LIB	Library used for intrinsic units
*SYSTEM.MISCINFO	#5:NESTAR.MISC	Configuration information

Remember that if there is no SYSTEM.PASCAL on the booted disk, the BOOT program will then use the SYSTEM.PASCAL on the library volume. The recommended configuration, then, is for the shared version of SYSTEM.PASCAL which is on #5: to be modified with ZAPPASCAL to use shared versions of the three files, and for individual user's boot volumes not to contain SYSTEM.PASCAL.

The changes must be made to an unmodified SYSTEM.PASCAL as received from Apple. If any local changes are to be made, such as the use of BINDER to change to GOTOXY module, those changes must be made after executing ZAPPASCAL.

To run ZAPPASCAL, mount the disk that contains the SYSTEM.PASCAL with the RW option, and X(ecute ZAPPASCAL. When it asks

Name of disk?

respond with the Pascal volume name (e.g. "PASCAL" or "#5") of the volume which contains the SYSTEM.PASCAL. It will then ask separately for each file:

Change SYSTEM.STARTUP (Y/N)?

ZAPPASCAL

Change SYSTEM.LIBRARY (Y/N)?

Change SYSTEM.MISCINFO (Y/N)?

You can choose to do any subset of the modifications. If the change is successful, it will say "SUCCESSFUL". If the change had been previously made, it will say "ALREADY CHANGED". If the proper place to change cannot be found, it will say "NOT FOUND".

These 'changes' do not change the names of the files, or the files themselves. The 'changes' are modifications to SYSTEM.PASCAL that cause it search for #5:NESTAR.MISC instead of SYSTEM.MISCINFO. Therefore, after executing ZAPPASCAL, be sure to create the NESTAR. files which the modified SYSTEM.PASCAL will be looking for. In most environments, the NESTAR.LIB will simply be a copy of SYSTEM.LIBRARY, the NESTAR.START will be the startup program by that name distributed by Nestar, and the NESTAR.MISC will be a copy of the SYSTEM.MISCINFO used by most of the stations in the installation.

NOTES

- Only the patch to SYSTEM.STARTUP can be made to versions of SYSTEM.PASCAL distributed with Pascal release 1.0. The other changes require Pascal release 1.1.
- If a particular user station wants to use a different version of any of the three files, it will need to have a private copy of SYSTEM.PASCAL on its booted disk. ZAPPASCAL can be run against that private version so that any subset of three files can come from #5, and the others will come as private versions with the original names from the booted disk.

5.8 SETPROFILE Utility Program

The BOOT program supports station-dependent profiles. Each station can have its own autoboot defaults, which are invoked when the station is powered on. If a profile record is not present for a particular station, a system-wide default profile is used. The System Manager sets these defaults using SETPROFILE.

The profile records are NFS binary (T=B) files, each 2 blocks long (size=2.B). The record /MAIN/SYSTEM/PROFILE/\$nn is used when station \$nn is powered on. If a station's profile is not present in /MAIN/SYSTEM/PROFILE, the profile for a default (/MAIN/SYSTEM/PROFILE/\$00) is used by BOOT. Therefore /MAIN/SYSTEM/PROFILE/\$00 must be present. The default (\$00) profile distributed with the system can also be changed using SETPROFILE.

5.8.1 How to Use SETPROFILE

Versions of SETPROFILE exist in both Pascal and DOS.

To use SETPROFILE, X(ecute PASCAL:SETPROFILE from the Pascal command level at any user station or RUN SETPROFILE under DOS 3.2.1 or DOS 3.3. (SETPROFILE for DOS requires Applesoft and 32K.)

SETPROFILE will display the number of the station being used and will ask for the number of the station for which a profile is to be set.

When modifying a profile, a password may be specified for the profile by entering a colon and the password after the \$nn station number.

The program then prompts for each allowed default:

```

Boot Volume: /MAIN/?
Boot automatically: NO?
Pascal access rights: RW,UPD?
DOS access rights: RW,UPD?
Library volume: /MAIN/PASCAL/LIB?

```

If no profile has already been set for the indicated station, the prompts display the defaults set in the system \$00 profile (shown in the example above), which is used if no individual station profile is set. Otherwise, the prompts list those defaults currently set in the station.

When the defaults have been entered, the program displays a summary and asks

SETPROFILE

Ok to update profile (Y/N)?

Enter Y to accept the defaults, N to reenter the defaults.

Chapter 6

Clock/Calendar Option6.1 Clock/Calendar Specifications

Nestar offers a real-time clock/calendar option as part of the Cluster One/Model A System. This option gives the file server the ability to maintain the current date and time, and to supply that information to stations on the network. In addition, files maintained by NFS are timestamped when created, when first accessed each day, and when first modified after each mount.

The clock/calendar option consists of hardware and software components. The hardware is an Apple peripheral card manufactured by Nestar, with the following attributes:

- Supplies year, month, date-of-month, day-of-week, and time in 24-hour clock notation.
- Resolution to 1 second.
- Accuracy is crystal controlled to better than +/- 0.005%.
- On-card rechargeable Ni-Cad battery backup maintains time and date for at least 4 weeks without external power.
- Low active power dissipation (less than 250 mW).
- Very low standby power dissipation (less than 0.18 mW).
- Write-enable and battery-enable jumpers.
- PC board is double sided with component legend, solder mask both sides, and gold-plated contacts.

The software consists of

- An offline utility program to set the current time and date (see following section).
- Code within the Network File Server to
 - (a) time and date stamp newly created files
 - (b) time and date stamp files the first time they are modified after each new MOUNT of the file
 - (c) time and date stamp files the first time they are accessed each day

CLOCK

(d) implement the TIMESTAMP file server command which supplies a timestamp string to any requesting user station

- An example Pascal UNIT which user stations can use to reformat the timestamp string into a formatted date such as

SAT 7-FEB-81 18:13:08

The unit is called DATEUNIT. Pascal UNITS are discussed in Section 7.4 of the Users Manual.

- Modifications to appropriate file server utilities so that those utilities will access and use the clock/calendar when time and date information is needed. The disk formatter, for example, will mark newly formatted disks with the date and time of formatting.

6.2 The CLOCKSET Utility Program

CLOCKSET is an offline utility program which runs in the file server Apple and is used to set the date and time in the clock/calendar card. It is to be used as follows:

(1) Make sure that the WE (write enable) and BAT (battery enable) jumpers are in place on the clock/calendar card. The BAT jumper is normally disconnected for storage and shipment to avoid discharging the Ni-Cad battery.

(2) With the Apple powered off, insert the clock/calendar card in slot 1. Insert the other cards as necessary for the file server.

(3) Boot from a Nestar 8" floppy or hard disk, as usual, using <esc> to override automatic chaining to NFS.

(4) Type X and CLOCKSET to execute the clockset utility.

(5) The program will display

THE CURRENT DATE AND TIME IS:

MON 17-DEC-80 02:40:16

DO YOU WANT TO SET THE CLOCK?

Respond with Y to proceed, and answer the questions as in the following example:

```
DAY OF THE WEEK (1ST 3 LETTERS)? TUE
DAY OF THE MONTH (1-31)? 7
MONTH (1ST 3 LETTERS)? FEB
YEAR? 1981
HOUR (00-23)? 18
ENTER THE MINUTE AND HIT RETURN
WHEN IT IS EXACTLY THAT TIME.
MINUTE? 44
```

The clock/calendar will then be set, and it will return to step 5. For the date and time set in the above example, it would display:

THE CURRENT DATE AND TIME IS:

TUE 7-FEB-81 18:44:00

DO YOU WANT TO SET THE CLOCK?

Respond with N to exit the program.

(6) You may remove the WE (write-enable) jumper if you wish to prevent accidental resetting of the date and time.

The clock/calendar will continue to maintain the correct time for up to four weeks when the Apple is turned off. The battery will be trickle-charged whenever the Apple is on. The clock/calendar card may be removed from the Apple (when power is off!) and the time will still be updated, but care should be taken not to short or touch any pins or contacts to avoid changing the rate of the battery-powered oscillator.

Appendix A

NFS ErrorsA.1 Introduction

Errors in this Appendix are listed in the following order:

<u>Section</u>	<u>Error Type</u>
A.2	I/O Errors
A.2.1	Primary I/O Error Codes
A.2.2	Device Error Subcodes
A.2.2.1	Floppy Disk Device Subcodes
A.2.2.2	Hard Disk Device Subcodes
A.3	Errors While Booting the File Server
A.4	File Server Errors
A.5	Unexpected System Errors

A.2 I/O Errors

I/O error codes reported by the file server (NFS and the various offline utilities) consist of two parts:

- (a) A primary I/O error code, which will sometimes be an NFS error message,
- (b) Two device subcodes which are device-dependent and describe the details of the error.

A.2.1 Primary I/O Error Codes

These codes are displayed if no NFS text message is supplied. These codes may be displayed in decimal or hexadecimal.

Hex Decimal

\$01 1 Boot failure

The volume header has incorrect boot information. See the section describing NFS boot errors.

\$03 3 Verify failure

APPENDIX A

Data written to the device was read back and did not exactly match the data in memory. Could be device or memory failure.

\$05 5 Disk change not reset

The hardware indicated that a floppy disk had been changed, and the software had not reset the indicator. This is either a failure in the "disk-change" hardware on the controller or floppy disk, or a bug in the software.

\$07 7 Format error

The floppy diskette is formatted with a sector size other than 256. The disk should be reformatted with the FORMAT utility.

\$09 9 Memory not present

The I/O buffer memory is not functioning.

\$0B 11 Bad drive number

A drive number other than 1 and 2 (for floppy disks) or 5 and 6 (for hard disks) was specified.

\$0D 13 Controller not present

There is no controller installed in the proper slot for the device, or the controller is not working. Slot assignments are as follows:

Hard disk unit 5: slot 2
Hard disk unit 6: slot 3
Floppy disk units 1 and 2: slot 4

\$0F 15 Hard disk error

An error occurred on a hard disk; see the device subcodes for more information.

\$11 17 Format entry not allowed

An attempt was made to format a device from an unauthorized program.

\$80 128 Not ready

The device or controller is not ready to accept

commands. For floppy disks, this may indicate that no diskette has been inserted. For hard disks, this may indicate that the warm-up time has not yet elapsed.

\$xx xx Other errors

If the primary I/O error code is other than the above, then it is the same as the first device subcode; see the table of subcodes for the appropriate device.

A.2.2 Device error subcodes

When a device-dependent error occurs, two subcodes are displayed whose interpretation depends on the device type. These codes may be displayed in decimal or hexadecimal. Each subcode is a single byte whose bits represent various conditions, and several bits may be on simultaneously so that their sum represents the total subcode. Not all bits indicate errors; some are simply status information.

A.2.2.1 Floppy Disk Device Subcodes

Subcode 1

Hex bit	Decimal bit	Meaning
\$80	128	Disk not ready. Perhaps no diskette is inserted.
\$40	64	For write commands: the diskette is write protected.
\$20	32	For write commands: write fault. A hardware error in the disk drive was detected.
\$10	16	Record not found. The header of the desired record was not found. Probably indicates that the diskette is defective or needs to be formatted. Sometimes indicates that the disk drive needs realignment.
\$08	8	Data (CRC) error. A data error was found in a header or data block. If the previous bit (\$10) is also on, the error is in the header, otherwise it is in the data part of the record. Indicates either a worn or badly formatted

APPENDIX A

diskette, or a drive which is misaligned.

\$04	4	Lost data/track zero. For read or write commands, it indicates that there has been a controller failure. For seek commands, it indicates that the drive is positioned to track 0.
\$02	2	Index/Data request. For read or write commands, it indicates that disk data is ready. For seek commands, it indicates that the diskette index hole has been detected.
\$01	1	Busy. The controller and disk are busy processing a command.

Subcode 2

Subcode 2 bits are informational only. They do not necessarily indicate errors.

Hex bit	Decimal bit	Meaning
\$80	128	Data request. Disk data is ready.
\$40	64	Interrupt request. The controller is signalling that the operation is over.
\$20	32	Disk changed. The drive is reporting that the diskette has been changed since the last time it was accessed.
\$10	16	Two-sided. The drive is reporting that the diskette currently inserted is double sided.

A.2.2.2 Hard disk device subcodes

Subcode 1

Hex bit	Decimal bit	Meaning
\$80	128	Drive error. See subcode 2 for

more information.

\$40	64	Write error. The write enable switch was closed, or the hardware detected a write unsafe condition.
\$20	32	Defective track. An attempt was made to read or write on a track formatted as a defective track.
\$10	16	ID not found. The required record could not be found after two revolutions of the disk.
\$08	8	ID error. The ID field of a record has incorrect parity.
\$04	4	Data error. The check field of a data record indicates an uncorrectable error.
\$02	2	Write guard error. An attempt was made to write on a track marked read-only.
\$01	1	Seek error. The ID found did not match the expected ID.

Subcode 2

Hex bit	Decimal bit	Meaning
\$80	128	Track zero error.
\$40	64	Diagnostic error.
\$20	32	End of cylinder.
\$10	16	Spin acceleration/deceleration out of limits.
\$08	8	Ready. The disk is up to rotational speed.
\$04	4	Illegal command.
\$02	2	Landing zone. The heads are located over the safe landing zone.

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\$01 1 Track zero. The heads are
located over track zero.

A.3 Errors while booting the file server

If errors occur while booting the NFS station, a message in the following form is printed:

UNIT uu, PHASE pp, ERROR xx yy zz

where:

uu is the unit number being booted (1, 2, 5, or 6),

pp is the phase during which the error occurred (see below)

xx is the hexadecimal primary I/O error code (see table)

yy,zz are the device error subcodes (see table)

Boot Phases

The following description of the NFS boot process may be helpful in diagnosing errors that occur.

PHASE 10

The volume header of the disk unit is checked. Physical sectors 0 to 3 are read. Errors may indicate that the volume is not properly formatted, or that the controller and drive are not ready.

PHASE 11

The second-level boot is read from the pascal boot virtual disk (usually /MAIN/SYSTEM/BOOT). Before doing so, physical sector 0 is checked for correct block type, block ID, and non-zero pointer to the boot volume. If sector 0 is not correct, a primary disk error 1 is generated. The first 4 sectors (Pascal blocks 0 and 1) of the boot volume are then read to location \$4000, and control is transferred to that code. If a "break" to the Apple monitor occurs, it may indicate a bad second-level boot program or a hardware problem in the Apple.

Errors may indicate that the boot volume has never been initialized (see the SETBOOT command of FILDEBUG), or that the volume does not exist or has been recreated without changing SETBOOT.

PHASE 20

The directory of the pascal boot virtual disk is read. The directory is located on relative sectors 4 to 11 of the boot volume, corresponding to Pascal blocks 2 to 5. If the third-level boot program cannot be found in the directory, the message "NO FILE THIRD.BOOT" is printed.

Errors may indicate that the virtual disk has been destroyed, or that the file THIRD.BOOT has been removed.

PHASE 21

The third-level boot is read from the pascal boot virtual disk. A total of 8 sectors (4 Pascal blocks) are read to location \$6000, and control is transferred to them.

PHASE 30

The entry for SYSTEM.APPLE is found in the directory of the boot volume. The first 12K of the file are read from the disk to the RAM on the language card.

PHASE 31

The next 4K bytes of SYSTEM.APPLE are read from the disk. The version is checked to insure that it corresponds to Apple Pascal release 1.1.

After Phase 31 is complete, control is transferred to the Pascal system initialization routine. The screen is first filled with reverse @ symbols momentarily, and then cleared to blanks, after which the SYSTEM.STARTUP program on the boot volume is executed.

A.4 File Server Error and Information Messages

When the file-server receives a Network command from a user-station, it executes the command, if possible, and, in any case, returns two variables:

a return code--an integer between 0 and 140

a return message, such as OK, ILLEGAL COMMAND, or TYPE=PASCAL

Chapters 6 (DOS) and 7 (PASCAL) of the User Manual describe how these variables are displayed in direct mode under DOS or by the Pascal CMD program and how to access them within a BASIC or Pascal program.

Messages are of several types:

information, such as OK, IN USE, TYPE=BINARY

user errors such as syntax errors or attempting to access a Network file without the necessary access rights

system errors such as memory full or disk full

In this list, messages are classified as:

general syntax

pertaining to a specific command

system errors

file system errors.

General Syntax (0-19)

0,OK

(Not an error.) The command was syntactically correct and was executed without error.

1,ILLEGAL COMMAND

The command verb cannot be recognized, or cannot be executed from this user station operating system environment. The command verb is the first word of the command, and must be separated from the rest of the command with one or more blanks.

2,NAME PARAMETER REQUIRED

The first parameter of the command must be a non-null pathname.

3,UNRECOGNIZED PARAMETER

A keyword parameter was not recognized. Check the spelling carefully, and make sure that it is properly separated from the previous and following items with commas.

4,ILLEGAL DRIVE NUMBER

A drive number must be specified with "D" followed by an integer in the range 1 to 255. Example: "D4".

5,ILLEGAL STATION NUMBER

A station number must be specified as a two-digit hexadecimal number preceded with \$, in the range \$1 to \$FE. Example: "\$2D".

7,PARAMETER APPEARS TWICE

A keyword parameter appears more than once in a single command. There can only be one occurrence of a keyword parameter, even if multiple occurrences have the same value.

8,ILLEGAL TYPE PARAMETER

The "T=" value is not one of the legal volume types. It must be one of B (binary), D (DOS), P (Pascal), Y (directory), S (system). Example: "T=P".

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9,COMMAND TOO LONG

An NFS command must be no longer than 80 characters. In unusual cases where this is a problem, long commands can often be shortened by using a default directory, or by assigning access rights in a subsequent PROTECT command.

10,PARAMETER TOO LONG

The new name given as the second parameter of the RENAME command must be no more than 15 characters long. Remember that RENAME changes only the last name in the sequence of names which constitute a pathname. If you wish to change the name of a directory, give the pathname of the directory itself as the first parameter of RENAME.

11,ILLEGAL PROTECTION PARAMETER

The value of the PUBACC, GRPACC, or PRVACC protection item is incorrect. The value must be some combination of the letters RWECD (read, write, erase, create, and delete), or may be null. For example, "GRPACC=RW" or "PUBACC=".

12,NO STATION CMD; USE \$NN PREFIX

The "station" command has been removed. Use "\$nn <command>" where nn is the station number on whose behalf you wish to issue the command. (NFS console only.)

13,ILLEGAL NUMBER (NEGATIVE OR TOO BIG)

The number was less than 0 or bigger than 32767. Number may be specified in decimal, or in hexadecimal preceeded by \$. Examples: "42", "\$1A3".

19,HELP FILE NOT FOUND

There is no HELP file for the word used as an operand of the HELP command. Use the HELP command with any parameters to see what the possible HELP parameters are. (The system manager has the option of removing all HELP files to save space.)

Create (20-25)

20,TYPE PARAMETER REQUIRED (T=)

The type parameter was missing. Example: "T=D".

21,SIZE OUT OF RANGE (<0B OR >32752B)

The value of the SIZE parameter was negative or greater than 32752 blocks. Each block is 512 bytes. Other units that can be specified are C (characters), S (256-byte sectors), and K (1024 bytes). If the units are omitted, B (512-byte blocks) is assumed. Examples: "SIZE=280", "SIZE=2000S".

23,SIZE PARAMETER REQUIRED WITH T=B

The SIZE parameter must be specified to create a binary volume. The size may be an overestimate of the size of the data to be BSAVED into the volume, but it must not be less.

24,SIZE OUT OF RANGE (<1C OR >48K)

The limits on the size of a binary (T=B) file are between 1C (one byte) and 48K (49152 bytes) regardless of the units used in the specification.

25,SECTORS PARAMETER REQUIRED WITH T=D

When creating a DOS (T=D) volume, you must specify the number of sectors per track. (Use SECTORS=13 for DOS 3.2.1 and earlier volumes, or SECTORS=16 for DOS 3.3 volumes. For information about varying the size and number of sectors per track, see the section on VDOS CREATE in the User's Manual.)

Delete (26-29)

29,CURRENTLY MOUNTED OR DEFAULT DIR

You cannot delete a volume which is currently mounted by any station, or which is the default directory (see the SET DIR command) of any station.

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Mount (30-34)

30,DRIVE REQUIRED

You must specify what drive the volume is to be mounted on. Example: "D4".

31,IN USE

The volume you asked to mount is in use by another station. You are therefore denied exclusive use of that volume.

32,IN EXC USE

The volume you asked to mount is in exclusive use by another station. You are therefore denied any use of the volume.

34,RW NOT ALLOWED ON DIRECTORIES

You are not allowed to mount a directory (T=Y) volume for write access.

Unmount (35-39)

35,DRIVE OR "ALL" REQUIRED

You must specify a drive number or "ALL" on the UNMOUNT command. Examples: "UNMOUNT D1", "UNMOUNT ALL".

36,NOT CURRENTLY MOUNTED

The drive number specified in the UNMOUNT command does not have any virtual volume mounted on it by the NFS.

Lock (40-44)

40,ILLEGAL LOCK NAME

A lock name must be 1 to 15 characters long.

41,IN USE

The lock name specified is in use by another station. You are therefore denied exclusive use of the lock.

42,IN EXC USE

The lock name specified is in exclusive use by another station. You are therefore denied any use of the lock.

Unlock (45-49)

45,NOT HELD

The lock name specified is not currently held by your station.

Bsave/Bload/Brun (50-55)

51,NOT BINARY

The pathname identifies a volume which is not binary (T=B). Only binary volumes can be used for BSAVE, BLOAD, or BRUN commands.

52,NOT PREVIOUSLY SAVED

The binary volume was created but has never had any data written into it using the BSAVE command. It can not not be used with BLOAD or BRUN until it has been BSAVED into.

53,FROM PARAMETER REQUIRED

For BSAVE, the FROM parameter, which specifies the memory area from which data is to be taken, must be provided. Example: "FROM=\$1000".

54,SIZE PARAMETER REQUIRED

For BSAVE, you must provide the SIZE parameter on the BSAVE command to indicate how much data is to be saved. This value must be less than or equal to the size of the volume specified on the original CREATE command. Example: "SIZE=256.C".

55,FILE WAS THERE; REP NOT SPECIFIED

Data has already been saved in the binary volume. To replace that data, you must specify "REPLACE" as a parameter in the BSAVE command.

APPENDIX A

Set/List (56-58)

57,FILE IS NOT A DIRECTORY

The pathname given in a SET DIR command identifies a volume which is not a directory (T=Y).

58,DATE MAINTAINED AUTOMATICALLY

The SET DATE command cannot be used when the clock/calendar option of the file server station is installed. The date and time are maintained by the clock/calendar.

Show (59-69)

59,TYPE=SYSTEM

(Not an error.) The volume mounted on the drive for which you did a "SHOW TYPE" is a system volume (T=S).

60,SHOW OPTION NOT RECOGNIZED

The operand of a "SHOW" command was not recognized. Check the spelling and make sure there are no extraneous items in the command.

61,DRIVE REQUIRED

For the "SHOW TYPE" command you must specify the drive number on which the volume is mounted. Example: "SHOW TYPE D12".

62,NOT CURRENTLY MOUNTED

The drive number specified has no volume mounted on it by the NFS.

64,NO DEFAULT DIRECTORY SET

(Not necessarily an error.) This response to the "SHOW DIR" command indicates that there is no default directory established for this station by the NFS.

65,TYPE=PASCAL

(Not an error.) The volume mounted on the drive for which you did a "SHOW TYPE" is a Pascal volume (T=P).

66,TYPE=DOS

(Not an error.) The volume mounted on the drive for which you did a "SHOW TYPE" is a DOS volume (T=D).

67,TYPE=BINARY

(Not an error.) The volume mounted on the drive for which you did a "SHOW TYPE" is a binary volume (T=B).

68,TYPE=DIRECTORY

(Not an error.) The volume mounted on the drive for which you did a "SHOW TYPE" is a directory (T=Y).

69,UNKNOWN TYPE

The volume mounted on the drive for which you did a "SHOW TYPE" is not a standard volume type.

70,yymmddhhmmssw

(Not an error) Returns date and time information in encoded form. For example, the NFS command `TIMESTAMP` returns the current year, month, day, hour, minute, second, and day of the week (Sunday = 1) in the form 70,8104301859381 (that is, 6:59 P.M., Sunday, April 30, 1981).

71,--t--tt--t-t----

(Not an error) Returns types of virtual disks currently mounted on drives 1-16 (Y, P, D, B). The system responds to the NFS command `SHOW TYPES` using this format.

Local Commands (90-92)

90,DRIVE NUMBER(S) REQUIRED

A drive number, or list of drive numbers, is required for this command. Example: "SET DRIVES 4,5 VIRTUAL".

91,DRIVE NUMBER CAN NOT BE USED

There are 12 drives (also called "volumes") in Pascal, but only some of them can be made virtual with the SET DRIVE local command. In Pascal Version 1.0, drives 4,5,9,10,11, and 12 are valid. In Pascal Version 1.1, drives 3 through 12 are valid.

APPENDIX A

92,NO MORE CHANNEL SPACE (MAX=3)

In the Pascal environment, a "channel" is established for each different file server you have simultaneous access to. There is space for three channels, so you may have drives virtual to no more than three file servers at the same time. There also must be a channel established for the default file server to which commands are sent. This error indicates that you have asked for more than three file server channels to be established.

System Errors (94-99)

94,NOT CONNECTED

This is a network error that indicates that the connection to another station has been terminated prematurely.

95,UNRECOGNIZABLE NETWORK RESPONSE

The last response message from file server did not contain a numeric error code, as expected. This may indicate incorrect logic in the use of NETUNIT procedures from within Pascal programs.

96,NO NETWORK CARD IN SLOT

The slot number specified does not have a Nestar network interface card installed, or the card is defective.

97,MEMORY FULL

The file server has no space left for tables needed to complete your request. See the System Manager's Manual for information about file server table space. This does NOT refer to memory space in the user station.

98,NETWORK ERROR

The network routines were unable to complete the transaction. The error may be transient; see the description of NETUNIT for more information. This error does not occur from most user-level programs, such as CMD.

99,USER ABORT

The network-abort key (CNTL-SHIFT-N) was pressed while a network transaction was queued up or in progress. The transaction was aborted.

NFS File Errors (101-134)

101,END OF FILE OR RECORD OUT OF RANGE

An attempt was made to read a block or sector of a volume which is outside the legal range for that volume.

102,FILE NOT FOUND

The volume specified by the pathname was not found, or one of the directories in the pathname was not found. Check the spelling of each filename in the pathname. If the name does not begin with a slash, check that the current default directory is the correct one.

103,BAD DELIMITER IN PATHNAME

A delimiter other than "/" or ":" was found in a pathname. Make sure that you have not omitted a comma separating the pathname from other operands in the command.

104,FILE NAME OR PASSWORD TOO BIG

A single filename (the part between slashes in a pathname), or password (the part after a colon in a pathname) is longer than the maximum of 15 characters.

105,NO ACCESS FOR READ TO DIRECTORY

You have been denied read access to a directory which is part of the specified pathname.

106,NON DIRECTORY FOUND IN PATHNAME

One of the names in the pathname (other than the last name) identifies a volume which is not a directory (T=Y). Only the last thing in a pathname can be other than a directory.

107,END OF PATHNAME IS A DIRECTORY

The pathname specifies a directory (T=Y) in a context where a non-directory volume is required.

109,ROOT DIR NOT SPECIFIED; NO DEFAULT

The specified pathname does not begin with a slash, and there is no default directory recorded for this station by the file server. If you wish to completely specify the pathname, begin with a slash and the name or number of the disk unit. If you wish to use the current default directory, do not begin the pathname with a slash. You may use the "SHOW DIR" command to find out the current default directory, and the "SET DIR" command to establish one.

110,NO ACCESS FOR READ

You have been denied read access to the volume specified by the pathname, or to a directory along the path.

111,NO ACCESS FOR WRITE

You have been denied write access to the volume specified by the pathname.

112,NO ACCESS FOR APPEND (not yet implemented)

You have been denied append access to the volume specified by the pathname.

113,NO ACCESS FOR ERASE

You have been denied erase access to the volume specified by the pathname. Erase access is necessary to delete the file.

114,NO ACCESS FOR CREATE

You have been denied access to create or rename an entry in one of the directories specified in the pathname.

115,NO ACCESS FOR DELETE

You have been denied access to delete or rename an entry in one of the directories specified in the pathname.

116,CANT DELETE NON-EMPTY DIRECTORY

The pathname specified in a DELETE command identifies a directory, and that directory is not empty, that is, it still points to other volumes. Only empty directories

can be deleted by a single file server DELETE command. To delete non-empty directories (i.e. subtrees) see the description of the TDELETE utility in the User's Manual.

117, MEMORY FULL

The file server has no space left for tables needed to complete your request. See the System Manager's Manual for information about file server table space. This does NOT refer to memory space in the user station.

118, DISK FULL

There is not enough contiguous space left on the disk unit to create the volume. The LIST command when used to display the root directory will give information about the space available on a disk unit. Example: "LIST /MAIN".

119, DIRECTORY FULL

There is not enough space left to create more entries in the directory, and the directory cannot be expanded. (In NFS version 1.1 and later, directories are automatically expanded as necessary to accomodate new entries.)

120, INTERNAL ERROR

An internal error has been detected by the file server. Additional information is written on the console of the file server. That information and the circumstances surrounding the error should be transmitted to Nestar for diagnosis. The file server should be restarted as soon as practical.

121, UNINITIALIZED DISK

The disk unit (hard disk or floppy disk) has not been initialized. All disks must be formatted and initialized using the Nestar FORMAT program; see the System Manager's Manual for details.

122, WRONG SOFTWARE VERSION

The disk format is not compatible with version of the file server currently running. (This error cannot occur with any file servers so far released.)

123, FILE ALREADY EXISTS

The file you have asked to create, or the new name used in a RENAME command, already exists in the directory.

124,DISK I/O ERROR, SUBCODES x,y

A hardware I/O error was detected. The details of the error are described in the subcodes; see the table of I/O errors for more information.

125,VERIFY FAILED (BAD MEMORY)

All disk write operations are verified by reading back the recorded data and comparing it to the data stored in memory. This error indicates that the disk data did not compare correctly. It sometimes indicates a memory error in the file server, and not a disk error.

126,DISKETTE WAS CHANGED

The door to the floppy disk unit was opened. The file server assumes that the diskette was changed, and does not allow operations to proceed. See the description of the DISK CHANGE command in the System Manager's Manual for a discussion of safely changing floppy diskettes which are in use.

127,BAD DISKETTE FORMAT

The floppy diskette is not correctly formatted. All diskettes must have been formatted by the Nestar FORMAT program; see the System Manager's Manual for details.

128,BAD UNIT NUMBER IN PATHNAME

The first item after the initial slash in a pathname is a number, but it is non in the legal range for unit numbers (1 to 6).

129,DISKETTE WRITE PROTECTED

An attempt was made to write to a floppy diskette which is write protected. Remember that the convention for 8" diskettes is opposite to that for mini-diskettes: the hole must be covered to allow writing. See the System Manager's Manual for more details.

130,NEED PRIVATE PASSWORD FOR PROTECT

In order to execute the PROTECT command for any volume, the private password must be specified in the pathname or as a default private password. The password must be specified whenever the volume has a non-null private

password, regardless of the access rights currently assigned to the volume.

131,UNIT NAME NOT FOUND

The name after the initial slash of a pathane is not the name of a disk unit currently recognized by the file server. If a floppy diskette has just been inserted into a drive, use the "SHOW VOLS" command to have the file server search for all new disk units and show you the results. After that, all displayed names will be recognized as disk unit names. You can also use the unit number in place of a name, if you wish.

133,DISK NOT READY

The disk unit specified is not ready. For a floppy disk, it may indicate that no diskette has been inserted. For hard disks, the three minute warmup period after initial power up may not have elapsed. It may also indicate a controller or disk drive failure.

134,DISK CONTROLLER NOT PRESENT

There is no controller installed for the disk unit, or the controller is defective. The controller for floppy disk units 1 and 2 goes in slot 4 of the NFS, and controllers for hard disk units 5 and 6 go in slots 2 and 3 of the NFS, respectively.

A.5 Unexpected System Errors

If the file server detects a run-time error, the display will show:

```
EXEC ERROR #n  
S #s, P #p, I #i  
TYPE <SPACE> TO CONTINUE
```

If this happens, record exactly the full contents of the file server's display (for transmittal to Nestar), press the <reset> button, and enter C600G followed by <return> to reboot the system. Then restart the file server (see Section 5.1). The file server's data structures are in an unknown state after a run-time error and the file server should not be allowed to continue running.

Appendix B

Changes to Cluster/One Model A in Release 1.1

(U: User's Manual; S: System Manager's Manual)

<u>Section</u>	<u>Version 1.1</u>
S 2.3, 2.5	Supports two hard disks, up to 66 megabytes shared disk capacity.
S 2.5, 3.1ff, 4.1ff	Simplified system startup
U 2.4ff	Supports Apple DOS 3.3
U 6.1ff	
U 2.5	Notation "T=V" in directory listings is replaced by the proper type designator (e.g., D, B, P).
U 3.1.3	Directories are automatically expanded as necessary.
U 5.0 (MOUNT)	MOUNT allows a new usage mode, UPD, which permits one user RW access to a file, while others may mount the file RO, SHR at the same time.
U 5.0 (CREATE)	CREATE command can now be used to create and mount a file in one command.
U 5.0	New NFS commands: RENAME, TIMESTAMP, SHOW ALL LOCKS, SHOW ALL MOUNTS, SHOW TYPES
S 4.1ff	New NFS Console commands: TRACE, PASSWORD, SUPER, \$nn. Deleted command: STATION.
U 6.6	DOS 3.3 virtual diskettes can be of variable size and need not be INITed. (Use VDOS CREATE)
U 7.0ff	Supports Apple Pascal 1.1.
U 8.1	New Pascal utilities allow users to tailor a central Startup program for use at their individual stations (NESTAR.START, ZAPPASCAL), access and manipulate the file system in new ways (FILEINFO,

CHANGES

TDELETE, DIRLIST), and access Network resources and facilities from within their local pascal programs (DATEUNIT, NETLINK); note especially extensive changes in NETUNIT. New program SETPROFILE allows the System Manager to create a file of autoboot defaults for the individual station.

S 5.1ff

New and changed file server utilities FORMAT, FILTRAN, DISKCOPY, CLOCKSET, FILCHECK, FILDEBUG, HDISK, ZAPPASCAL, SETPROFILE expand offline maintenance resources available to the System Manager and allow individual station autoboot profiles.

U 8.2.2

New DOS utility FIDMORE allows a user to load and modify a copy of Apple DOS 3.3 FID to accept drive numbers from 1 to 9. New program SETPROFILE allows the System Manager to create a file of autoboot defaults for the individual station.

U Appendix B

BOOT program changes allow each station to have its own auto-boot defaults.

S 6.1

Optional NFS Clock/Calendar

Appendix C

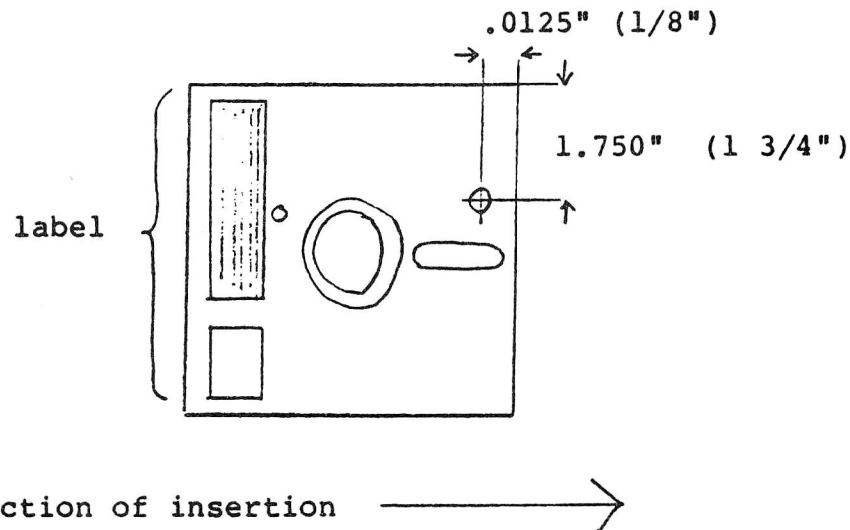
Protecting Diskettes from Erasure

You can protect all the programs on a diskette from being erased, or new ones from being added, by use of the write protect feature. A disk is write protected when the write protect notch is cut, or open. A disk without a notch, or with it covered is not protected.

NOTE: This is exactly the opposite convention from that used for 5 1/4" diskettes.

Some 8 inch diskettes come with the write protect notch already cut, in which case you need only cover or uncover the hole to modify the protection. You must use an opaque sticker when covering the hole. Make sure that the disk is not write protected when you take a fresh disk from a package and attempt to format it for use on the Cluster/One system.

If you need to cut a write protect notch, the diagram below indicates its position. First layout the center position, and then punch with a standard hand punch. Be very careful to accurately position the hole; an error could result in destroying the disk inside the jacket.



Appendix D

Quick Reference List of Privileged Console Commands

CLEAR

-clear system console display

DISKCHANGE Uu

-allows safe removal and insertion of floppy disks in unit u

DISPLAY on/off

-turns console display ON or OFF

PASSWORD [pw]

-sets console password

RESET

-reset the Network File Server

SET DATE yymmdd

-sets system date to year yy, month mm, date dd

SHOW ALL MOUNTS

-display all mounts of all stations using this file server

SUPER cmd

-override file server passwords on NFS files.

TRACE on/off

-turn on or off NFS trace mode

\$nn cmd

-execute a command for a network user station

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READERS COMMENT FORM

CLUSTER/ONE MODEL A
NESTAR SYSTEMS, INCORPORATED

You are encouraged to use this form to communicate to Nestar any problems, bugs or suggestions associated with Nestar products. We would like your comments on improving the system itself, as well as this documentation.

Nestar installation location:

Submitter's name :

Address :

Nestar environment

Model A or Model One:

Hard disk size (if present):

Number of user stations:

Language used:

Type of application:

Description of problem or suggestion:

Please mail this form to:

Nestar Systems, Incorporated
2585 E. Bayshore
Palo Alto, California, 94303

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